CONNECT Nevada®

STATE BROADBAND ACTION PLAN
NOVEMBER 2014

TABLE OF CONTENTS

The purpose of this report is to summarize Nevada's broadband access, adoption, and use, as well as the best next steps for addressing any deficiencies or opportunities for improving the statewide technology ecosystem.

"We must continue to drive investment in broadband technology that fast-tracks job growth and provides a platform for spurring innovation across our state. My budget includes $3 million to help residents of rural Nevada use broadband access to start and grow businesses, or telecommute to anywhere in the world. These improved broadband connections will also allow the electronic exchange of health information between providers and hospitals to improve the quality of care."

– Governor Sandoval,
2011 State of the State address

INTRODUCTION

BACKGROUND

Today, technology plays a pivotal role in how businesses operate, the type of service consumers expect, how institutions provide services, and where consumers choose to live, work, and play. The success of a community has also become dependent on how broadly and deeply the community adopts technology resources – this includes access to reliable high-speed networks, digital literacy of residents, and the use of online resources locally for business, government, and leisure. As noted in the National Broadband Plan, broadband Internet is "a foundation for economic growth, job creation, global competitiveness and a better way of life." [1]

Despite the growing dependence on technology, as of 2013, 30% of Americans did not have a high-speed connection at home.[2] Connected Nation's studies also show that 17 million families with children do not have broadband at home, and 7.6 million of these children live in low-income households.[3] In 2014, Connected Nation also surveyed 4,206 businesses in 7 states. Based on this data, Connected Nation estimates that nearly 1.5 million businesses – 20% – in the United States do not use broadband technology today.[4]

Deploying broadband infrastructure, services, and application, as well as supporting the universal adoption and meaningful use of broadband, are challenging but required building blocks of a twenty-first century community. To assist communities, Connected Nation developed the Connected Community Engagement Program to identify local technology assets, complete an assessment of local broadband access, adoption, and use, and develop an action plan for pursuing solutions.[5]

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1 *Connecting America: The National Broadband Plan*, Federal Communications Commission, April 2010, http://www.broadband.gov/download-plan/.

2 *Broadband Technology Fact Sheet*, Pew Research Internet Project, September 2013, http://www.pewinternet.org/fact-sheets/broadband-technology-fact-sheet/.

3 *The Adoption Gap in Low-Income Households with Children: 2011 Residential Survey Preliminary Findings,* Connected Nation Inc., September 2011, http://www.connectednation.org/_documents/connectednationlow-income2011surveyfindingsfinal.pdf.

4 *Broadband and Business: Connected Nation 2014 Business Survey Results,* Connected Nation Inc., http://www.connectednation.org/sites/default/files/biz_infographic_2014_cn_final.pdf.

5 Connected Nation, parent company for Connect Nevada, is a national non-profit 501(c)(3) organization that works in multiple states to engage community stakeholders, state leaders, and technology providers to develop and implement technology expansion programs with core competencies centered around the mission to improve digital inclusion for people and places previouslyunderserved or overlooked.

HISTORY OF THE PROJECT

Connect Nevada, established in 2009, is a subsidiary of Connected Nation, Nevada's state designee for the United States Department of Commerce's State Broadband Initiative grant. The public-private initiative has been established to work with each of the state's broadband providers to create detailed maps of broadband coverage, conduct surveys to assess the current state of broadband adoption across Nevada, and to help communities plan for technology expansion. Connect Nevada works closely with the Nevada Broadband Task Force to bring in sector representatives as they address challenges and take advantage of opportunities related to broadband across the state. Connect Nevada's efforts are funded by the United States Department of Commerce's State Broadband Initiative grant program through the National Telecommunications and Information Administration (NTIA). More information is available at http://www2.ntia.doc.gov.

Connect Nevada's primary partner is the Nevada Broadband Task Force, established July 15, 2009, by Executive Order. This body consists of 12 members appointed by the Governor of Nevada. Members of the Task Force represent the following areas: rural health and hospitals, rural K-12 school districts, rural libraries, distance education/higher education, public safety/Nevada Department of Transportation, the telecommunications industry, the cable industry, the wireless industry, local government, Nevada Commission on Economic Development, city/county organizations, and Nevada Native Americans. According to the Executive Order, the Task Force will work to identify and remove barriers to broadband access and identify opportunities for increased broadband applications and adoption in unserved and underserved areas of Nevada. The Task Force shall also oversee all necessary duties and responsibilities to reach the goal to expand broadband technology including the application of federal funding/grants, grant compliance, mapping, and data management.

MAPPING

As part of the Nevada State Broadband Initiative, and in partnership and at the direction of the Nevada Broadband Task Force, Connect Nevada produced an inaugural map of broadband availability in spring 2010. The key goal of the map was to highlight communities and households that remain unserved or underserved by broadband service; this information was essential to estimating the broadband availability gap in the state and understanding the scope and scale of challenges in providing universal broadband service to all citizens across the state. Since the initial map's release, Connect Nevada has collected and released new data every six months, with updates in October and April annually.

The most current Statewide and County Specific Broadband Inventory Maps released in the fall of 2014 depict a geographic representation of provider-based broadband data represented by cable, DSL, wireless, fiber, etc. These maps also incorporate data such as political boundaries and major transportation networks in the state.

MAPS CREATED FOR SBI:

- Broadband Service Inventory
- Broadband Service Inventory (Advertised Speeds of at Least 3 Mbps Downstream and 768 Kbps Upstream)
- Density of Households Unserved by a Broadband Provider
- Maximum Advertised Download Speed
- Density of Providers
- Broadband Growth
- Multiple/Single Platform
- Underserved Areas
- Underserved Areas with Mobile
- Average Download Speed
- Broadband Service Inventory by Congressional District

CUSTOM MAPS CREATED FOR LOCAL/STATE PLANNING:

- Telemedicine Map (State Asset Inventory)
- Mobility Fund Eligible Census Blocks
- Douglas County Speed Test Map
- Douglas County Industrial Zone Map
- Douglas County Commercial Zone Map
- Douglas County Speed Test Contest Map
- FCC Rural Experiments Eligible Census Blocks

ESTIMATE OF BROADBAND SERVICE AVAILABILITY IN THE STATE OF NEVADA BY SPEED TIER AMONG FIXED PLATFORMS

SBI SPEED TIERS DOWNLOAD/UPLOAD	UNSERVED HOUSEHOLDS		SERVED HOUSEHOLDS		PERCENT OF SERVED HOUSEHOLDS BY SPEED TIER	
	2011	2014	2011	2014	2011	2014
At Least 768 Kbps / 200 Kbps	10,420	8,933	995,829	997,317	98.96	99.11
At Least 1.5 Mbps / 200 Kbps	15,560	10,398	990,689	995,852	98.45	98.97
At Least 3 Mbps / 768 Kbps	27,528	14,824	978,722	991,426	97.26	98.53
At Least 6 Mbps / 1.5 Mbps	47,782	43,281	958,467	962,969	95.25	95.79
At Least 10 Mbps / 1.5 Mbps	86,117	47,779	920,132	958,471	91.44	95.25
At Least 25 Mbps / 1.5 Mbps	108,108	62,839	898,141	943,411	89.26	93.76
At Least 50 Mbps / 1.5 Mbps	139,618	74,701	866,631	931,549	86.12	92.58
At Least 100 Mbps / 1.5 Mbps	1,002,849	89,193	3,400	917,057	.34	91.14
At Least 1 Gbps / 1.5 Mbps	1,006,250	1,004,904	0	1,346	0	.13

Source: Connect Nevada, October 2014

Table 1 reports updated summary statistics of the estimated fixed, terrestrial broadband service inventory (excluding mobile and satellite service) across the state of Nevada; it presents the number and percentage of unserved and served households by speed tiers. The total number of households in Nevada in 2010 was 1,006,250, for a total population of 2,700,551 people. Table 1 indicates that 99.11% of households are able to connect to broadband at download speeds of at least 768 Kbps and upload speeds of at least 200 Kbps. This implies that the number of households originally estimated by Connect Nevada to be unserved has dropped from 10,420 households in the fall of 2011 to 8,933 households in the fall of 2014. Of those 8,933 currently unserved households, however, 5,175 households are located in rural areas of the state. Further, approximately 991,426 households across Nevada have broadband available of at least 3 Mbps download and 768 Kbps upload speeds. The percentage of Nevada households having fixed broadband access available of at least 6 Mbps download and 1.5 Mbps upload speeds is estimated at 95.79%

Taking into account both fixed and mobile broadband service platforms, an estimated 99.73% of Nevada households have broadband available from at least one provider at download speeds of 768 Kbps or higher and 200 Kbps upload or higher. This implies that 0.27% of households remain unserved by a terrestrial broadband connection (including mobile).

As differences in broadband availability estimates between the fall of 2011 and the fall of 2014 show, additional participating broadband providers can have a large impact upon Nevada broadband mapping inventory updates. Further, the measured broadband inventory provides an estimate of the true extent of broadband coverage across the state. There is a degree of measurement error inherent in this exercise, which should be taken into consideration when analyzing the data. This measurement error will decrease as local, state, and federal stakeholders identify areas where the displayed coverage is underestimated or overestimated. Connect Nevada welcomes such feedback to be analyzed in collaboration with broadband providers to correct errors identified in the maps.

In addition, the broadband availability data collected, processed, and aggregated by Connect Nevada has been sent on a semi-annual basis to the NTIA to be used in the National Broadband Map, and comprises the source of Nevada's broadband availability estimates reported by the NTIA and the Federal Communications Commission (FCC) in the National Map. The National Broadband Map can be found here: http://www.broadbandmap.gov and the Map's specific page for Nevada can be found here: http://www.broadbandmap.gov/summarize/state/nevada.

INTERACTIVE MAP

Connect Nevada provides My ConnectView™, an online tool developed and maintained by Connected Nation intended to allow users to create completely customized views and maps of broadband infrastructure across the state. The self-service nature of this application empowers Nevada's citizens to take an active role in seeking service, upgrading service, or simply becoming increasingly aware of what broadband capabilities and possibilities exist in their area, city, county, or state. http://www.connectnv.org/interactive-map#

PROVIDER ENGAGEMENT

The October 2014 data update submission under the SBI program includes datasets for 100 percent of the Nevada provider community, or 59 total providers. This dataset includes business/commercial and residential providers. A complete roster by provider type and website is included on the following page.

PROVIDERS | OCTOBER 2014

PROVIDER NAME	PLATFORM	WEBSITE
Advanced Telcom, Inc.	Fiber	http://www.integratelecom.com/
amargosavalley.com	Fixed Wireless	http://www.amargosavalley.com/
Arizona Nevada Tower Corporation	Backhaul, Fixed Wireless	http://www.antower.com/
AT&T, Inc.	DSL, Mobile Wireless	http://www.att.com/
Avant Wireless	Fixed Wireless	http://www.avantwireless.com/index.html
CalNeva Broadband	Cable	http://blog.calneva.org/
CC Communications	DSL, Fiber	http://www.cccomm.net/cccomm/
CenturyLink	DSL, Backhaul	http://www.centurylink.com/
Charter Communications, Inc.	Cable, Backhaul	http://www.charter.com/
Cogent Communications, Inc.	Fiber, Backhaul	http://www.cogentco.com/
Commnet Wireless, Inc.	Mobile Wireless	http://us.choice-wireless.com/
Cox Communications	Cable, Backhaul	http://ww2.cox.com/
Cricket Wireless	Mobile Wireless	http://www.leapwireless.com/
Digis	Fixed Wireless	http://www.jabbroadband.com/
Express Internet	DSL, Fixed Wireless	http://www.expint.net/
EzzNet	Fixed Wireless	http://www.ezznet.com/
Filer Mutual Telephone Company	DSL	http://www.filertel.com/
Fort Mojave Telecommunications, Inc.	DSL, Fiber	http://www.ftmojave.com/
Frontier Communications Corporation	Backhaul, DSL	http://www.frontier.com/
Great Basin Internet Services	Fixed Wireless	http://www.greatbasin.net/
High Desert Internet Services	Fixed Wireless	http://www.hdiss.net/
High Speed Networks	Fixed Wireless	http://www.hsne50.com
Highlands Wireless Inc.	Fixed Wireless	http://www.highlandswireless.net
Hot Spot Broadband	Fixed Wireless	http://www.hotspotbroadband.com/
Hughes Network Systems	Satellite	http://www.hughes.com/
Humboldt Telephone Company	DSL	http://oiutelecom.net/
InfoWest	Fixed Wireless	http://www.infowest.com/
Level 3 Communications	Fiber, Backhaul	http://www.level3.com/
Lincoln County Telephone System	DSL, Fiber	http://www.lctsys.com/
lv.net	Fixed Wireless	http://www.lv.net/
MegaPath Corporation	DSL, Backhaul	http://www.megapath.com/
Metro PCS Wireless, Inc.	Mobile Wireless	http://www.metropcs.com/
Mighty Moose	Fixed Wireless	http://springcreekwireless.com/index.htm
Mt Wheeler Power	Fixed Wireless, DSL	http://www.mwpower.net/
MVDSL	DSL, Fiber	http://www.mvtel.com/
NewWave Communications	Cable	http://www.newwavecom.com/
NSHE	Backhaul	http://system.nevada.edu/
nvhispeed	Fixed Wireless	http://www.nnvhispeed.com/
Oasis	Fixed Wireless	http://www.oasisol.com/
PC Internet	Fixed Wireless	http://www.winnemucca.net/
Quicknet	Fixed Wireless	http://www.mvqn.net/
Reliance Connects	DSL, Fiber	http://www.relianceconnects.com/
Rural Telephone Company	DSL	http://www.rtci.net/
Satview	Cable	http://www.wenr.net/
Schat.net	Fixed Wireless	http://www.schat.com/
Skycasters	Satellite	http://www.skycasters.com/
Sprint Mobile	Wireless, Backhaul	http://www.sprint.com/
StarBand Communications	Satellite	http://starband.com/
TDS Telcommunications Corporation	Cable	http://www.tdstelecom.com/
Tele-NET.net	Fixed Wireless	http://www.tele-net.net/
T-Mobile	Mobile Wireless, Backhaul	http://www.t-mobile.com/
Tw Telecom Of Nevada, LLC	DSL, Fiber, Backhaul	http://www.twtelecom.com/
VegasWiFi Communications	Fixed Wireless	http://www.vegaswifi.net/
Verizon Wireless	Mobile Wireless, Backhaul	http://www.verizonwireless.com/
ViaSat, Inc.	Satellite	http://www.wildblue.com/
Wireless Beehive, LLC	Fiber, DSL	http://www.wirelessbeehive.com/
WUE, Inc.	Mobile Wireless	N/A
XO Communications, LLC	Backhaul	http://www.xo.com/
Zayo Bandwidth, LLC	Backhaul	http://www.zayo.com/

Connect Nevada also continued to perform broadband verification activities through several means over the duration of the project. In addition to confirmation of service area(s) by each provider, Connect Nevada has conducted field validation efforts. As of final submission, 86.21 percent of viable residential providers have been validated through field verification activities.

03 / VALIDATION LOCATIONS

- ● Validation Location
- ● City
- — Interstate
- — U.S. Road
- — County
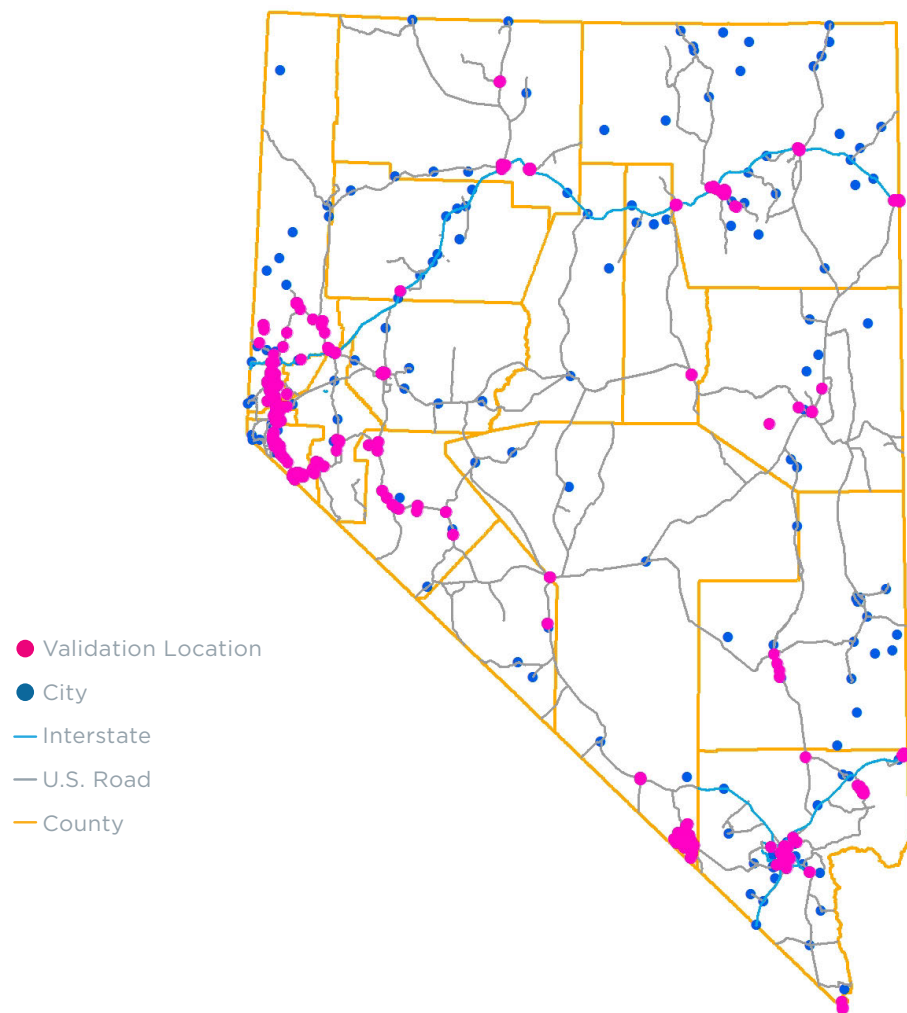
The Connect Nevada website (www.connectnv.org) has served a prominent role in the outreach and data collection effort. This program asset has provided a way for the general public to participate in the process by offering interactive tools for users to test their connection speed, submit broadband inquiries, or contact a program representative.

BUSINESS AND RESIDENTIAL TECHNOLOGY ASSESSMENTS

To complement the broadband inventory and mapping data, Connect Nevada periodically conducts statewide residential and business technology assessments to understand broadband demand trends across the state. The purpose of this research is to better understand the drivers and barriers to technology and broadband adoption and estimate the broadband adoption gap across the state of Nevada. Key questions the data address are:

- Who, where, and how are households in Nevada using broadband technology?

- How is this technology impacting Nevada households and residents?

- Who is not adopting broadband service and why?

- What are the barriers that prevent citizens from embracing this empowering technology?

Through Connect Nevada's research, many insights are realized. The state's 2014 Residential Technology assessment revealed the following key findings:

- 80% of adults in the state subscribe to home broadband service, up from 78% in 2010.

- More than three out of five Nevada adults (61%) use mobile broadband service, up from 39% in 2010 when Connect Nevada began measuring this trend.

- More than 423,000 adults still do not subscribe to home broadband service. These Nevadans cite many different reasons for not subscribing, including cost, the belief that broadband is not relevant or beneficial to them, and a lack of digital literacy skills.

- Nearly one in four parents of school-age children in Nevada (23%) say that their children's school provides them with a laptop or tablet computer; the majority of those parents (55%) report that receiving a computer from the school had a positive impact on their child's grades.

- Nearly one-half of working-age Nevada adults (46%) rely on the Internet to seek out or apply for jobs, while one in three (33%) go online to further their educations by taking online classes.

Additionally, the results of Connect Nevada's 2014 Business Technology Survey released in the summer of 2014, revealed the following key findings:

- More than four out of five businesses in the state (81%) use broadband, while 11,000 businesses do not.

- 25% of businesses in the state have difficulty finding employees with the necessary technological skills.

- Nevada businesses earned $15.6 billion in 2013 from online sales.

Over the duration of the project the following white papers were developed to address sector and demographic issues:

- Technology Use Among Rural Nevada Businesses, 2013

- Mobile Broadband in Nevada: Access at Home or On the Go, 2013

- Now Hiring: The Impact of Broadband on Nevada's Workforce, 2013

- Technology Adoption Among Hispanics (also available in Spanish), 2012

- Teleworking in Nevada: Linking Nevadans to Jobs, 2012

- The Power of Broadband: Boosting Nevada's Education System, 2012

- E-Health: Empowering Nevadans Across All Walks of Life, 2011

- Broadband and Business, 2011

Full reports are available at http://www.connectnv.org/policy.

SUMMITS

Connect Nevada has hosted three statewide Summits. The first Summit focused on economic development, the second on local community engagement, and the third on education. The potential fourth Summit was reconfigured into two workshops, the product of which is this Plan. The Summits held attendance of more than 150 and drew stakeholders from government, healthcare, education, tribes, libraries, and public safety.

- **Wired for Success – November 14, 2011, in Dayton, Nevada**

  This first Summit aligned with an announcement by the Governor of his strategic economic development plan. Connect Nevada took the Governor's targeted sectors and drew in stakeholders such as broadband providers and local business owners with topics of how to engage key business opportunities through broadband. This resulted in a high initial engagement commitment from several rural counties. The Summit featured an introduction of the project and effective ways of dealing with technology and policy issues related to broadband.

- **Connecting Communities – October 24, 2012, in Las Vegas, Nevada**

  The second Summit focused on local community engagement where counties that were working on broadband-related issues could share ideas and solutions. This allowed the teams to draw on similarities as well as to have face time with solution providers (e.g., telcos). The keynote at this event was the Vice President of Connectivity for S.W.I.T.C.H., a large server farm.

- **Learning in the Digital Space – November 18, 2013, in Reno, Nevada**

  The third Summit focused on education and brought in thought leaders from across the state to discuss technology and the role of broadband in the education space. While subjects like 1:1 and innovation were a part of this discussion, there was also emphasis on the release of data collected by Education SuperHighway. This partnership between Connect Nevada and Education SuperHighway provided for a much more detailed analysis of the gaps in broadband coverage in education across the state. As a result, Connect Nevada has been very closely engaged in the implementation of a statewide 1:1 plan and has helped identify real solutions for several small districts.

LOCAL PLANNING

By actively participating in the Connected Community Engagement Program, 14 rural counties are now boosting the community's capabilities in education, healthcare, and public safety and stimulating economic growth and spurring job creation. These communities have collaborated with multiple community organizations and residents to:

1. Empower a community team leader (local champion) and create a community team composed of a diverse group of local residents from various sectors of the economy including education, government, healthcare, the private sector, and libraries.

2. Identify the community's technology assets, including local infrastructure, providers, facilities, websites, and innovative uses employed by institutions.

3. Complete the Connected Assessment, a measurement of the community's access, adoption, and use of broadband based on the recommendations of the National Broadband Plan.

4. Match gaps in the local broadband ecosystem to solutions and best practices being used by communities across the nation.

5. Pursue Connected Certification, a nationally recognized platform for spotlighting communities that excel in the access, adoption, and use of broadband.

CONNECTED ASSESSMENT

The Connected assessment framework is broken into 3 areas:
ACCESS, ADOPTION, & USE.

Each area has a maximum of 40 points. To achieve Connected Certification, the community must have a minimum of 32 points in each section and 100 points out of 120 points overall.

The ACCESS focus area checks to see whether the broadband and technology foundation exists for a community. The criteria within the ACCESS focus area endeavors to identify gaps that could affect a local community broadband ecosystem including: last and middle mile issues, cost issues, and competition issues. As noted in the National Broadband Plan, broadband ACCESS "is a foundation for economic growth, job creation, global competitiveness and a better way of life."

Broadband ADOPTION is important for consumers, institutions, and communities alike to take the next step in fully using broadband appropriately. The ADOPTION component of the Connected Assessment seeks to ensure the ability of all individuals to access and use broadband.

Broadband USE is the most important component of ACCESS, ADOPTION, and USE because it is where the value of broadband can finally be realized. However, without ACCESS to broadband and ADOPTION of broadband, meaningful USE of broadband would not be possible. As defined by the National Broadband Plan, meaningful USE of broadband includes those areas of economic opportunity, education, government, and healthcare where values to individuals, organizations, and communities can be realized.

ANALYSIS OF CONNECTED ASSESSMENT

The Community Technology Scorecard provides a summary of the state's Connected Assessment. The Connected Assessment's criteria are reflective of the recommendations made by the Federal Communications Commission's National Broadband Plan. Lower scores indicate weaknesses in the community's broadband ecosystem but do not necessarily signify a lack of service.
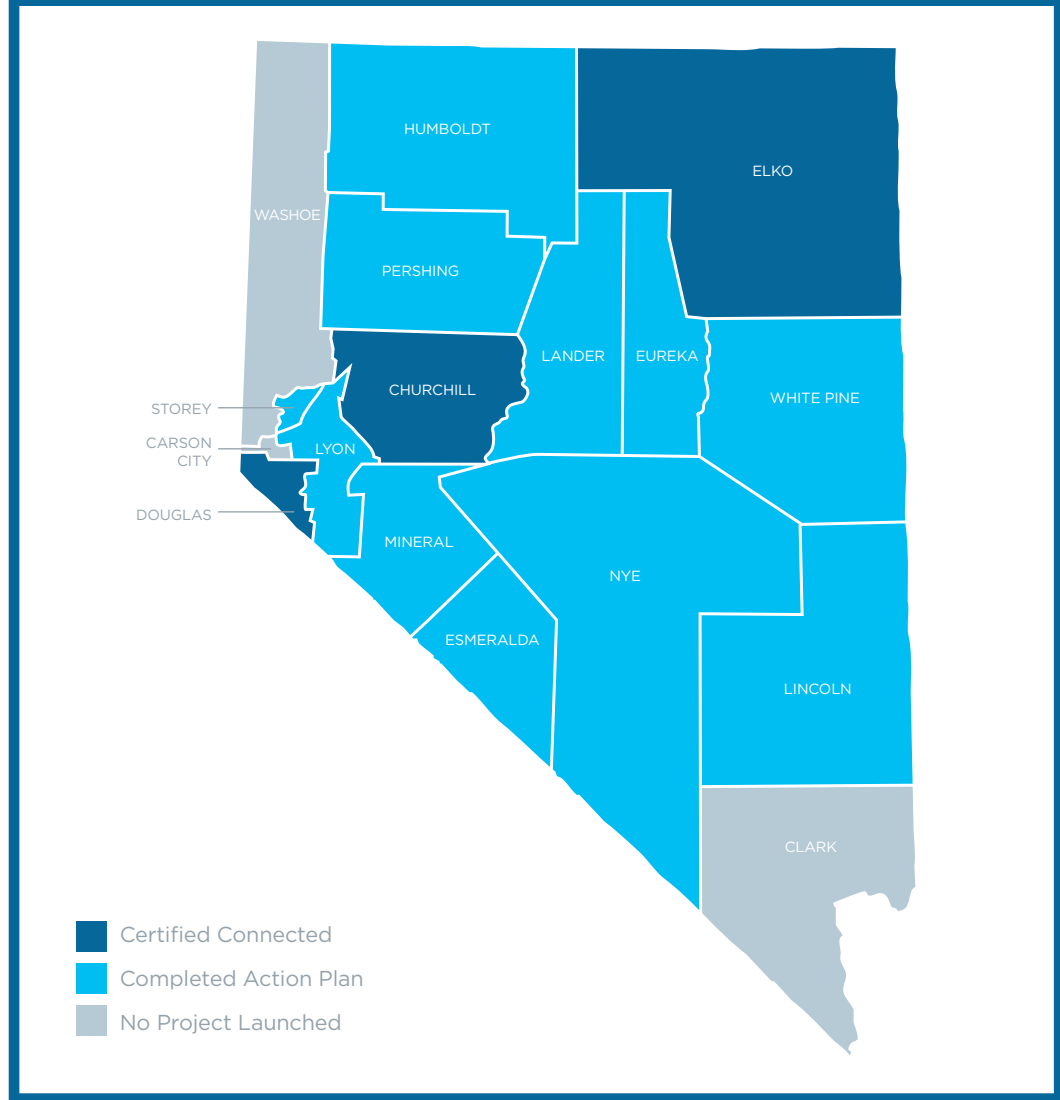
MASTER CONNECTED COMMUNITY SCORECARD

COUNTY NAME	ACCESS SCORE	ADOPTION SCORE	USE SCORE	TOTAL
Churchill County	36	32	40	108
Douglas County	35	34	40	109
Elko County	32	40	33	105
Esmeralda County	16	10	15	41
Eureka County	20	26	26	72
Humboldt County	22	32	30	84
Lander County	27	24	39	90
Lincoln County	30	34	37	101
Lyon County	34	28	23	85
Mineral County	21	34	28	83
Nye County	27	30	39	96
Pershing County	17	28	33	78
Storey County	17	32	39	88
White Pine County	16	02	39	57

As a result of the Connected Community Engagement Program three Nevada counties achieved Certification: Churchill, Douglas, and Elko.

COMMUNITY ENGAGEMENT STATUS

WASHOE

HUMBOLDT

ELKO

PERSHING

LANDER

EUREKA

WHITE PINE

STOREY

CHURCHILL

CARSON CITY

LYON

DOUGLAS

MINERAL

NYE

ESMERALDA

LINCOLN

CLARK

■ Certified Connected
■ Completed Action Plan
■ No Project Launched

ACCESS SCORE EXPLANATION

Broadband Availability – is measured by analyzing provider availability of at least 3 Mbps download and 768 Kbps upload broadband service gathered by Connected Nation's broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

Broadband Speed – is measured by analyzing the speed tiers available within a community. Connected Nation will analyze broadband data submitted through its broadband mapping program. Specifically, Connected Nation will break down the coverage by the highest speed tier with at least 75% of households covered. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

Broadband Competition – is measured by analyzing the number of broadband providers available in a particular community and the percentage of that community's residents with more than one broadband provider available. Connected Nation performed this analysis by reviewing the data collected through the broadband mapping program. In communities that may have broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

Middle Mile Access – is measured based on a community's availability to fiber. Three aspects of availability exist: proximity to fiber middle mile points of presence (POPs), number of fiber middle mile providers available, and available bandwidth. Data was collected by the community in coordination with Connected Nation.

Mobile Broadband Availability – is measured by analyzing provider availability of mobile broadband service gathered by Connected Nation's broadband mapping program. In communities that may have mobile broadband data missing, community teams were able to improve the quality of data to ensure all providers are included.

ADOPTION SCORE EXPLANATION

Digital Literacy – is measured by first identifying all digital literacy programs in the community. Once the programs are determined, a calculation of program graduates will be made on a per capita basis. A digital literacy program includes any digital literacy course offered for free or at very low cost through a library, seniors center, community college, K-12 school, or other group serving the local community. A graduate is a person who has completed the curriculum offered by any organization within the community. The duration of individual courses may vary.

Public Computer Centers – is measured based on the number of hours computers are available each week per 1,000 low-income residents. Available computer hours is calculated by taking the overall number of computers multiplied by the number of hours open to a community during the course of the week.

Broadband Awareness – is measured based on the percentage of the population reached. All community broadband awareness programs are first identified, and then each program's community reach is compiled and combined with other campaigns.

Vulnerable Population Focus – A community tallies each program or ability within the community to encourage technology adoption among vulnerable groups. Methods of focusing on vulnerable groups may vary, but explicitly encourage technology use among vulnerable groups. Example opportunities include offering online GED classes, English as a Second Language (ESL) classes, video-based applications for the deaf, homework assistance for students, and job-finding assistance. Communities receive points for each group on which they focus. Groups may vary by community, but include low-income, minority, senior, children, etc.

USE SCORE EXPLANATION

Economic Opportunity – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within economic opportunity include: economic development, business development, tourism, and agriculture.

Education – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within education include K-12, higher education, and libraries.

Government – A community receives one point per basic use of broadband and two points per advanced use of broadband. Categories within government include general government, public safety, energy, and the environment.

Healthcare – A community receives one point per basic use of broadband and two points per advanced use of broadband. Entities within healthcare can include, but are not limited to, hospitals, medical and dental clinics, health departments, nursing homes, assisted living facilities, and pharmacies.

06 | **Over the life of the project and through data gathering at the local level, the following were identified:**

14	**177**	**77**	**42**	**56**	**48**
Engaged Communities Planning	Team Members	Public Computing Centers	Digital Literacy Programs	Broadband Awareness Programs	Vulnerable Population Programs

STATE POLICY RECOMMENDATIONS

As described above, the Connected Assessment process has engaged a wide variety of state and local stakeholders, many of whom used the process to develop and implement targeted, local interventions to improve broadband access, adoption, and use in their communities. In addition, though, during the course of the process, many common themes relating to Nevada state policy emerged.

In 2014, the Nevada Broadband Task Force convened many of these stakeholders and hosted two day-long workshops to identify and develop these ideas and proposals for Nevada. The workshops were held on September 15 and 17 in Las Vegas and Reno and featured speakers and discussion from more than 70 leaders in the public and private sectors. Attendees held in-depth conversations about sector and geographic challenges preventing broadband availability, adoption, and use and then held brainstorming sessions on solutions to these issues. After the workshops, these various solutions were developed and circulated to stakeholders, who were then asked to rank and vote on the importance and potential impact of these state-wide initiatives. These proposals were then presented to the Nevada Broadband Task Force for further review and consideration in this Plan.

The 2014 workshop process was specifically designed to develop and identify common themes that cut across many communities. In this Section, these recommendations are organized into four general categories:

1. Implementation and Governance of Nevada Broadband Policy

2. Improvement of Broadband Infrastructure Access in Nevada

3. Accelerating Broadband Adoption Among Nevada Consumers and Businesses

4. Increasing Broadband Utilization in Nevada Among Key Societal Sectors

IMPLEMENTATION AND GOVERNANCE OF NEVADA BROADBAND POLICY

Broadband access, and the applications it supports, is a transformative technology that is having immediate and comprehensive impact on virtually every sector of the Nevada economy, every level of government, and the social welfare of Nevadans. The Connect Nevada research described above shows an increasing reliance and dependence upon broadband technology throughout the state – as well as the risks to communities that do not have adequate access and vulnerable populations that are not in a position to fully take advantage of the technology.

Because broadband technology cuts across all of these sectors, a number of state and local governmental bodies have both a direct and indirect impact upon its proliferation and diffusion in Nevada. At the same time, broadband networks, even with the proliferation of many network providers, are largely designed and built with shared infrastructure – including highway rights-of-way, wireless towers, key Internet points of presence, and intercity fiber links. If there is one lesson to be learned from the Connect Nevada Connected Assessment process, it is that government and business policies and procedures developed independently for particular economic and governmental sectors in a bricks-and-mortar, analog age can have a significant impact on the diffusion of broadband technology.

A common theme of many local community participants, conference, and workshop stakeholders was the stated need for a central and institutional state office that would coordinate state and local policy to impact broadband access, adoption, and social use in the state.

Below are the recommendations prioritized by the workshop attendees and the Nevada State Broadband Task Force.

> **1.1 The State should create and fund an Office of Broadband Coordination, which will have the responsibility of overseeing implementation of the various recommendations of this State Technology Action Plan, in consultation with the Nevada State Broadband Task Force.**
>
> Mission and Mandate:
>
> - Identify and help secure federal and other funding for access, adoption, and use projects (such as federal grants).
>
> - Establish expectations for broadband service in the state.
>
> - Help eliminate redundancies in state governance regarding broadband.

- Help transition state government to VoIP and other broadband-enabled technology.

- Develop state consortium buying policies that will facilitate broadband investment and lower costs.

- Help ensure that state policy works closely with federal broadband policy initiatives, such as the Connect America Fund and Mobility Fund.

The Office of Broadband Coordination will aid Nevada in a multitude of ways including serving as a liaison among numerous state entities in order to ensure broadband is being utilized and expanded in the most efficient manner possible as Figure 7 illustrates.

07
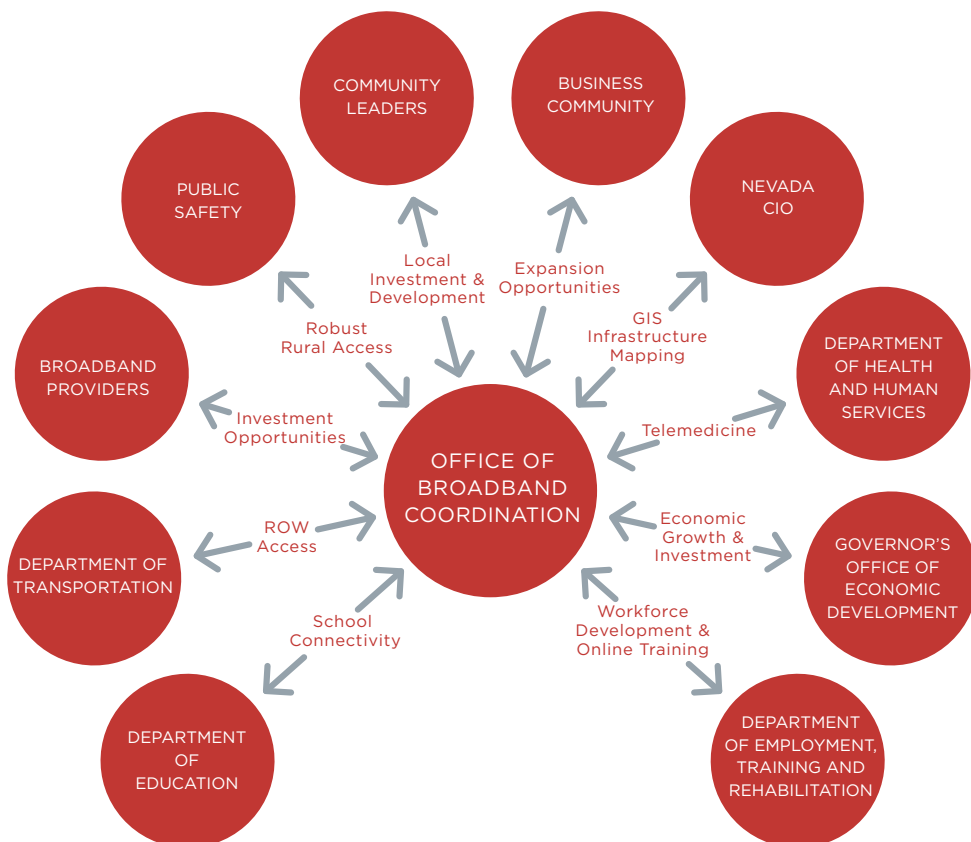
Additionally, the Office of Broadband Coordination will oversee any future state mapping initiatives recommended below that are funded by the state. At the end of 2014, federal funding for the Connect Nevada mapping project will cease. Moving forward, the Federal Communications Commission (FCC) will be collecting and publishing data on the availability of retail fixed and mobile broadband availability information twice a year. While that data will be useful, it will not map infrastructure facilities. The FCC will only be collecting data relating to the retail maximum offered speed for residential and business fixed broadband services. For mobile broadband services, the FCC will only collect "minimum advertised" speed, portions of which might not be publicly released. In rural areas, the FCC data will only be collected at the census block level.[6]

In contrast, the Connect Nevada mapping program directly maps infrastructure in a way that allows for the matching of broadband infrastructure to state institutional needs. One example of this approach is the targeted information and support Connect Nevada provided to the Governor's Telemedicine Working Group. As discussed below, there are similar needs in Nevada for public safety broadband infrastructure, vertical assets, and economic development opportunities. Because the FCC will only collect advertised retail service availability, even if that data were to be made available to Nevada, that data would not support those important state needs for infrastructure planning and economic development. In addition, with regard to retail broadband availability, the Connect Nevada project collects multiple speed tiers for both fixed and mobile technology and independently validates those capabilities statewide and locally. In rural areas, Connect Nevada collects broadband retail service availability at the address level, which is more granular than the upcoming FCC data process, and regularly processes inquiries from citizens, communities, and providers on service availability. This type of hands-on, local engagement allows for solutions-driven cooperation between providers and communities that has resulted in needed infrastructure upgrades.

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6 *Modernizing the FCC Form 477 Data Program,* Federal Communications Commission, WC Docket No. 11-10, Report and Order, 28 FCC Red 9887, 2013. The FCC was to have started collecting this data on October 1, 2014, but the FCC suspended that data collection due to difficulties with its electronic filing Interface. See Form 477 Filing Interface Remains Closed as Technical Improvements are Implemented, Federal Communications Commission, Wireline Competition Bureau, WC Docket No. 11-10, Public Notice, DA 14·1458, Oct. 2014. It is uncertain when the FCC will release or publish any of the data it may eventually collect through its new data collection process.

1.2 The Governor should re-charter a multi-stakeholder State Broadband Task Force, with the head of the Office of Broadband Coordination. The Task Force should be chaired by the Head of the Office of Broadband Coordination, and members of the Task Force should include the private sector from the broadband and technology industry, relevant state agencies, and local leaders.

Mission and Mandate: Educate policymakers on the importance of broadband to the achievement of state economic and social welfare goals with the official charter, including:

• Identify and remove barriers to broadband access.

• Identify opportunities for increasing broadband applications and adoption in unserved and underserved areas in Nevada.

• Oversee all duties/responsibilities to achieve these goals.

• Serve as a central point of collaboration/coordination for broadband projects statewide.

• Maintain a state map that provides broadband availability and speed information.

Re-chartering should include current members of the Nevada Broadband Task Force as well as representatives from the following industries:

• Public Safety – to ensure coordination with the state's FirstNet initiative.

• Corrections – to ensure that the broadband needs of the rural population and those in correctional facilities are addressed.

• Employment, Training and Rehabilitation – to ensure the needs of workforce development/training are addressed.

IMPROVEMENT OF BROADBAND INFRASTRUCTURE ACCESS IN NEVADA

2.1 Improve public safety communications, including statewide deployment of an interoperable public safety broadband network, NV911 implementation, public safety network infrastructure mapping, and support of Nevada 211 partnership.

Mission and Mandate: Leverage broadband technologies to enhance emergency communications to and from the public.

Broadband offers a unique opportunity to achieve a comprehensive vision for enhancing the safety and security of a community's residents. Broadband can help public safety personnel prevent emergencies and respond swiftly when they occur. Broadband can also provide a community with new ways of calling for help and receiving emergency information.

For example, first responders from different jurisdictions and agencies often cannot communicate during emergencies due to disparate communication systems and the lack of integration between these systems. However, wireless broadband supports the interoperability of communications systems that would allow first responders anywhere in the nation to communicate with each other, send and receive critical voice and data to save lives, reduce injuries, and prevent acts of crime and terror.

Furthermore, with broadband, 911 call centers (also known as public safety answering points or PSAPs) could receive texts, pictures, and videos from the public and relay them to first responders. Similarly, the government could use broadband networks to disseminate vital information to the public during emergencies in multiple formats and languages. Finally, Nevada 211, a comprehensive, free connection to critical health and human services, utilizes broadband to provide information about local community services in a single, statewide location that can be accessed via voice, text, or online. Launched in February 2006, Nevada 211 is a statewide partnership that is led by the State of Nevada, United Way of Southern Nevada, United Way of Northern Nevada and the Sierra, Crisis Call Center, and HELP of Southern Nevada. The goal of this partnership is to connect any and all Nevadans to vital health and human resources and to eliminate the confusion and frustration of not knowing where to turn in a time of need.

To overcome the challenges posed by disparate communication systems and dated technology, public safety agencies should collaborate with state and federal agencies in order to improve communication across organizational and jurisdictional boundaries. This is one of the priorities of the First Responder Network Authority (FirstNet). Created by the Middle Class Tax Relief and Job Creation Act of 2012, FirstNet was established as an independent authority within the NTIA in order to establish a single nationwide, interoperable public safety broadband network.

To find out more information on FirstNet and the Nationwide Public Safety Network, visit http://www.ntia.doc.gov/category/firstnet.

Other relevant initiatives include:

• Assistance to Firefighters Grants (AFG): The primary goal of the AFG Program is to meet the firefighting and emergency response needs of fire departments and non-affiliated emergency medical service organizations. AFG funds have helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards.

• Community Connect Grant Program: The Community Connect Grant Program provides financial assistance to furnish broadband service in unserved, often isolated, rural communities. The grants are used to establish broadband service for critical facilities such as fire or police stations, while also providing service to residents and businesses.

2.2 Analyze local policies and ordinances for conduciveness to broadband build-out, and ensure coordination between state government and federal agencies regarding broadband infrastructure on public lands.

Mission and Mandate: Ensure that local policies are conducive to broadband build-out. In addition, work to ensure that Nevada government is working with federal agencies to guarantee that broadband infrastructure can be adequately and timely built on federal lands.

High capital investment costs, including permit processing, pole attachment costs, and lack of effective planning and coordination with public authorities, directly impact the case for deployment. For example, the FCC's National Broadband Plan concludes that, "the rates, terms, and conditions for access to rights-of-way [including pole attachments] significantly impact broadband deployment." The costs associated with obtaining permits and leasing pole attachments and rights-of-way are one of the most expensive cost functions in a service provider's plans to expand or upgrade service, especially in rural markets where the ratio of poles to households goes off the charts. Furthermore, the process can be time consuming. For example, the process of attaching equipment to an already-existing pole, such as moving wires and other equipment and coordinating with electric and safety codes, can take months to complete.

Firms seeking to invest in broadband infrastructure in Nevada face a myriad of governmental authorities. Eighty-one percent of the area of Nevada – more than any other state – is owned or controlled by the federal government.[7] Since adoption of the National Broadband Plan, the Federal government has increased its effort to facilitate the ability of providers to utilize Federal lands for broadband networks. In June 2012, President Barack Obama issued Executive Order 13616 (Accelerating Broadband Infrastructure Deployment) to facilitate wired and wireless broadband infrastructure deployment on Federal lands, buildings, rights-of-way, federally assisted highways, Tribal and individual Indian trust lands. The Executive Order created a Broadband Deployment on Federal Property Working Group that would serve to coordinate federal agency procedures, requirements, and land policies across 14 Federal agencies. In the first year, the Federal Working Group created a database of federal assets suitable

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7 *Federal land Ownership: Overview and Data*, Congressional Research Service, June 2012, at 4 (Table 1). Of the nearly 57 million acres of Nevada owned by the Federal Government, the Bureau of Land Management owns 47.8 million acres, the U.S. Forest Service 5.7 million acres, the Fish and Wildlife Service 2.3 million acres, the National Park Service 774,751 acres, and the Department of Defense 281,442.

for broadband infrastructure uses, developed a common form for leases of federal property for broadband purposes, and developed an online platform for submission of those forms.[8] Nevada should monitor these reforms in Federal property access and work to ensure that Federal agencies fully implement the Executive Order and changes in a way that truly facilitates broadband investment that benefits Nevadans.

Local policies and ordinances in Nevada also can play a significant role in facilitating broadband investment by mitigating the high fixed costs of network construction. Incorporating and considering broadband in community planning processes, including zoning and public land policies, by local governments can improve broadband investment and access in their communities.

In particular, planning for future broadband needs by timely placement of empty conduit and ducts also can dramatically increase the pace of broadband network upgrades in Nevada. The cost of building or upgrading a network in areas where streets need to be dug up is substantially higher than the cost of building or upgrading a network where there is sufficient empty space in conduit or ducts that were placed – with foresight – years earlier. Because advance planning can lower cost of future investment, state and local policies should ensure that developers consider and ensure that adequate broadband infrastructure capacity will be in place in new developments. Such policies can include placement of adequately sized broadband conduit and ducts alongside roads and inside buildings, in order to "future proof" that development. Community and provider collaboration to problem-solve around local pole attachment and other right-of-way issues is one of the most effective opportunities to encourage faster, new deployment of infrastructure. In addition, as discussed above, mapping and knowledge of local infrastructure can facilitate and attract broadband investment and upgrades.

8 *Progress on Accelerating Broadband Infrastructure Deployment: Implementing Executive Order 13616,* Broadband Deployment on Federal Property Working Group, Aug. 2013, at 2-3
(available at: http://www.whitehouse.gov/blog/2013/09/16/accelerating-broadband-infrastructure-deployment-across-united-states.

The recommended Office of Broadband Coordination can also play a strong role in examining local policies, approaches, and best practices that can positively affect broadband investment in Nevada.

Benefits:

• Lowers cost barriers to improve the business case for broadband investment and deployment.

• Encourages good public policy and provider relations.

• Serves as a foundation for cooperative public-private partnerships relating to broadband infrastructure upgrades in Nevada.

Action Items:

• Convene a review of local policies, ordinances, and other barriers to broadband deployment and consult with community leaders, providers, utilities, and other members of the community to ensure that they are supporting policies (local ordinances, pole attachments, rights-of-way) that are conducive to broadband build-out.

• Develop an awareness campaign targeted toward community leaders to inform them of the benefits of broadband to the entire community derived from access to global resources that outweigh the need for some policies.

• Work directly with the Federal government with regard to broadband access policies for Federal lands and property in Nevada, so as to improve broadband infrastructure investment and options in Nevada.

2.3 Ensure ready and cost-effective access to poles, ducts, conduits, and rights-of-way, both privately-owned and publicly-owned.

Mission and Mandate: As discussed above, placement costs, which include cost of stringing fiber or attaching equipment to utility poles, are a significant component of broadband deployment costs. In addition, since these charges generally consist of per-pole or distance-based rental charges, high costs for leasing access to poles and rights-of-way affect deployment in distant, rural areas more than in dense urban areas.

The rates for attaching communications equipment to privately-owned poles, ducts, and attachments is subject to the federal Pole Attachment Act of 1978, which added Section 224 to the Communications Act of 1934. The Pole Attachment Act gives the FCC the authority to regulate the rates, terms, and conditions of attaching to that privately-owned infrastructure, but it specifically gives Nevada and other states the right to preempt those federal requirements.[9] The federal Pole Attachment Act of 1978 also does not regulate the rates, terms, and conditions of poles, ducts, conduit, and rights-of-way that are owned by state or local governments or railroads.

Nevada should establish, as a matter of state policy, that every infrastructure project should incorporate "Dig Once" principles, which include notification and facilitation of opportunities to lower the costs of broadband infrastructure investment.

Benefits:

• Lower costs of infrastructure deployment.

• Ensure efficient, multiple use of existing infrastructure like utility poles where feasible.

• Promote investment of broadband infrastructure in rural, distant areas where there is a need to attach to more poles or use more feet of rights-of-way per customer.

Action Items:

• Investigate utilizing Nevada's preserved authority under the federal Pole Attachment Act of 1978 to use attachment policies to promote and guide broadband investment.

• Convene workshop of related agencies, including Department of Transportation, to identify and catalog opportunities for Dig Once and joint trenching opportunities.

• Explore different methods of compensation for pole attachments and rights-of-way, including flat fees or fee rebates based on meeting broadband deployment or adoption targets.

• Educate local policymakers on the impact of pole attachment and rights-of-way policies on broadband infrastructure deployment.

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9 As of this writing, 19 states and the District of Columbia have done so. See *In the Matter of Implementation of Section 224 of the Act*, Federal Communications Commission, WC Docket No. 07-245, Report and Order and Order on Reconsideration, FCC 11-50, April 2011, Appendix C.

2.4 Continue to map growth in broadband in Nevada and create more detailed broadband maps that will incorporate speed testing and validation of service speeds and map middle mile infrastructure, both lit and unlit.

Mission and Mandate: Create a more detailed map for the community regarding available speeds, enabling the technology team and community stakeholders to better understand the broadband landscape and to address residential concerns anecdotally gathered at local technology team meetings. This also allows communities to initiate informed discussions with local providers to assist in addressing gaps in coverage and potential build-out plans.

The project should encourage residents to participate in data contribution through county-level speed testing, in order to validate available local providers' speeds and to better understand adoption trends among residents. Results from these speed tests can contribute to an overlay of broadband availability and show clusters of speed trends in a given area.

Benefits:

• County-wide speed testing will assist in validating available speeds of local providers. It will also enable a more detailed speed map for the technology's team use.

• Speed tests can help providers in the local area better understand adoption/subscriber trends to market service territories and more effectively plan for build-out.

• Gaps in speed coverage maps may elicit areas of technical challenges and locations that are underserved in a given area.

Action Items:

• Host a contest encouraging local residents to complete an online speed test, over a specific duration of time.

• Market the speed test to all residents in a given area with established parameters for participation.

• Collect, analyze, and map data in a format that can inform local planning by providers/community or both.

2.5 Establish a statewide "Dig Once" policy that will easily identify opportunities for joint trenching cost savings and ensure that broadband infrastructure improvements are considered alongside other infrastructure and public works projects.

Mission and Mandate: Establish as a matter of state policy that every infrastructure project should incorporate "Dig Once" principles, which include notification and facilitation of opportunities to lower the costs of broadband infrastructure investment.

Building broadband infrastructure is costly. According to the National Broadband Plan, deploying fiber can easily cost more than $100,000 per mile – and "the largest element of deployment costs is not the fiber itself, but the placement costs associated with burying the fiber in the ground (or attaching it to poles in an aerial build)." In certain cases, these placement costs can account for almost three-quarters of the total cost of a fiber deployment.

However, with adequate planning, these costs can be decreased substantially. According to the National Broadband Plan, "the cost of running a strand of fiber through an existing conduit is 3-4 times cheaper than constructing a new aerial build." In addition, joint trenching of infrastructure projects can cut placement costs dramatically, by sharing those costs of digging among not only broadband providers but other infrastructure costs.

As a result, many states and municipalities have in recent years adopted a variety of Dig Once policies. These policies range in scope and nature, involving a notification process in which interested parties are given a notice and an opportunity to install conduits and cabling in a trench opened by another infrastructure project. The United States Department of Transportation, Federal Highway Administration has listed several best practices for Dig Once state and local policies, noting that "Dig Once and joint-use of trenches have been practices recognized by state and local stakeholders as sensible solutions to expedite the deployment of fiber along main routes when implemented as part of a cooperative planning process."[10]

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[10] *Successful Practices of Broadband Deployment in Highway Rights of Way*, U.S. Department of Transportation, Federal Highway Administration, Office of Policy and Governmental Affairs, May 2013, available at http://www.fhwa.dot.gov/policy/otps/successprac.cfm.

The U.S. Department of Transportation noted the example of the Utah Department of Transportation (UDOT). UDOT installs empty conduit suitable for fiber optic placement during highway construction and then coordinates with providers on need and demand for space in that conduit. UDOT meets with telecom companies every two months on infrastructure projects, and has established a single point of contact for broadband providers. Annually, providers submit a list to UDOT of areas of need, and UDOT provides providers interactive online tools, ESRI maps of roads, fiber, and conduit.

Benefits:

- Lower costs of infrastructure deployment when done in conjunction with other infrastructure improvements (such as highway construction).

- Promote and facilitate integration of broadband infrastructure as part of local and regional economic development infrastructure initiatives.

Action Items:

- Convene workshop of related agencies, including Department of Transportation, to identify and catalog opportunities for Dig Once and joint trenching opportunities.

- Educate local policymakers on Dig Once best practices and opportunities.

2.6 Establish state funding or match dollars that will support broadband deployment in areas without adequate service, which could leverage and maximize the impact of other federal broadband infrastructure funding opportunities, such as the Connect America Fund.

Mission and Mandate: In addition to lowering the costs of private infrastructure investment, the State of Nevada can also facilitate direct investment into broadband infrastructure, particularly in rural areas without adequate access today. While improvements to management of state rights-of-way and access to poles can facilitate private direct investment statewide, direct investment by Nevada can be targeted to areas of particular need, such as rural areas without service today or areas to which improved broadband access is important to economic development, such as remote industrial sites.

In 2011, Governor Sandoval proposed to invest $3 million of state funds into broadband infrastructure projects in rural Nevada. A number of states have implemented similar programs, operated generally through state grants or similar approaches to private provider applicants. For example:

Minnesota is implementing a new, $20 million Border-to-Border Broadband Development grant program. The program is being implemented by the newly created Office of Broadband Development, in the Minnesota Department of Employment and Economic Development. Minnesota has set state broadband goals and targets and is now soliciting applications from private industry. This project is assisted by infrastructure mapping and research work conducted by Connect Minnesota, an affiliate of Connect Nevada. The grant program will give priority to applications to serve areas that do not have access to 4 Mbps down/1 Mbps up fixed broadband service in the state and will also assign projects that will offer new or substantially upgraded service to community anchor institutions (CAI), telemedicine, economically distressed areas of the state, and projects that include digital literacy training and broadband adoption components. To qualify, an applicant must provide at least 50% in its own funds to the project.[11]

Illinois is implementing a Gigabit Communities Challenge grant program that will award up to $6 million in grants to projects to bring ultra-high speed broadband to Illinois communities. Open to any private or public organization, the program will result in seed funding awards to build or expand world-class broadband networks in Illinois. Each proposal should outline a viable plan to connect at least 1,000 end users to an ultra high-speed broadband network. The program will target network upgrades to improve employment opportunities and enhance economic development in order to serve as "proofs-of-concept."[12]

New York has funded a number of broadband infrastructure initiatives through its regional economic development councils and its Connect NY broadband grant program, with grants that range in size from $70,000 to over $5 million.[13]

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11 *Border-to-Border Broadband Development Grant Program*, Minnesota Department of Employment and Economic Development, http://mn.gov/deed/programs-services/broadband/grant-program/index.jsp. Applications for the program were due in October 2014.

12 Illinois Gigabit Communities Challenge, http://www2.illinois.gov/gov/gigabit/Pages/Status.aspx.

13 New York State Broadband Program Office, http://nysbroadband.ny.gov/state-funding.

Direct state funding of broadband expansion initiatives at this time could also be beneficial if it worked in concert with the FCC's Connect America Fund. As of this writing, the FCC is in the final stages of offering over $6.4 million per year in annual subsidies to upgrade service to over 13,000 homes and businesses in the CenturyLink, AT&T, and Frontier service territories in Nevada. In the event those providers do not elect to receive this subsidy in exchange for a build-out commitment, the FCC plans to auction those subsidies to other broadband providers next year. Earlier this year, the FCC proposed that if it conducts that auction, it would consider providing a "bidding credit" in areas in which a state has decided to invest state funds to support that build-out.[14] Were the FCC to implement this rule, a Nevada infrastructure grant program would increase the chances of a Nevada provider in submitting a winning bid for federal broadband infrastructure subsidies.

Benefits:

• Target broadband investment to areas of need.

• Incentivize private investment and creative public-private solutions to broadband challenges in rural Nevada.

• Potentially leverage and increase chances of receiving federal Connect America Fund subsidies in rural Nevada.

Action Items:

• Identify target areas of state, from both service availability and economic development perspectives.

• Investigate similar state programs to those of Minnesota, New York, and Illinois.

• Ensure accuracy of broadband availability information and data before awarding any grant.

• Educate and perform direct outreach to broadband providers and local communities in rural areas, in order to begin process of developing innovative public-private initiatives that could be funded through such a grant program.

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14 *In the Matter of Connect America Fund,* Federal Communications Commission, WC Docket No. 10-90. Report and Order and Further Notice of Proposed Rulemaking, FCC 14-98, July 2014, at paras 97-101.

2.7 Complete a Vertical Assets Inventory to facilitate wireless broadband build-out.

Mission and Mandate: Develop a single repository of vertical assets, such as communications towers, water tanks, and other structures potentially useful for the support of deploying affordable, reliable wireless broadband in less populated rural areas or topographically challenged areas.

Wireless communications equipment can be placed in a wide variety of locations, but ideally, wireless providers look for locations or structures in stable conditions, with reasonably easy access to electricity and wired telecommunications, and with a significant height relative to the surrounding area. "Vertical assets" are defined as structures on which wireless broadband equipment can be mounted and positioned to broadcast a signal over as much terrain as possible. These assets include structures such as cell towers, water tanks, grain silos, and multi-story buildings.

The lack of easily accessible and readily usable information regarding the number and location of vertical assets prevents the expansion of affordable, reliable wireless broadband service. Wireless broadband providers must determine if it is worth the effort and expense to collect and analyze this data when making investment decisions. Public sector organizations are faced with the same challenges. A centralized and comprehensive vertical assets inventory can help wireless broadband providers expedite decisions regarding the deployment of affordable, reliable broadband service in rural areas.

As discussed above, the Federal government is developing an inventory of Federal property and assets available for lease to support wireless broadband build-out.[15] The State of Nevada and local governments can undertake a similar inventory process. The recommended Office of Broadband Coordination can serve as a facilitator of this information exchange, and help coordinate the availability of information about assets from various state and local government entities that the respective agency would be willing to lease to broadband providers. Having this information readily available ina central location would attract wireless infrastructure investment into Nevada as opposed to other states.

15 See note 8, supra.

Benefits:

- The vertical assets inventory provides data for private and public investment decisions, lowering the initial cost of efforts needed to identify potential mounting locations for infrastructure.

- The inventory can encourage the expansion of affordable, reliable wireless broadband services to underserved areas by shortening project development time.

Action Items:

- Identify or develop a vertical assets inventory toolkit to provide guidelines to identify structures or land that could serve as a site for installation of wireless communications equipment.

- Collect data that includes vertical asset type, owner type, minimum base elevation, minimum height above ground, and location.

- Identify and map elevated structures using the community's GIS resources. The resulting database should be open-ended; localities should be encouraged to continuously map assets as they are made available.

ACCELERATING BROADBAND ADOPTION AMONG NEVADA CONSUMERS AND BUSINESSES

3.1 Incorporate business and zoning information into the Nevada broadband maps, specifically to analyze business access in areas for possible economic development.

Mission and Mandate: Empower the technology team and local economic development professionals to better understand the broadband landscape in order to support current businesses' technology needs and to recruit new businesses to the area.

By collecting business and zoning information as a layer on the availability map, communities can analyze business access, specifically in regions considered for possible economic development.

Benefits:

- Local leaders and economic development professionals are better equipped to answer questions about properties' broadband readiness.

- Knowledge of broadband availability can be an important economic driver in marketing of a particular area to new business.

Action Items:

- Identify additional resources for zoning layers (e.g., GIS maps).

- Create an overlay to the last mile service maps provided by Connect Nevada.

- Discuss service needs with current and potential businesses.

- Analyze maps for gaps in service for business.

- Use broadband in awareness campaigns as a driver for new business recruitment.

3.2 Develop or identify a Broadband Training and Awareness Program for small and medium businesses, Community Anchor Institutions, and other entities.

Mission and Mandate: Businesses and other community institutions adopt and use broadband-enabled applications such as websites, social media, and e-commerce, resulting in increased efficiency, improved market access, reduced costs, and increased speed of both transactions and interactions.

Methods of implementing such a broadband awareness program include, but are not limited to, facilitating awareness sessions, holding press conferences led by community leaders, inviting speakers to community business conferences or summits, and generating public service announcements. It is also important to educate local businesses about Internet tools that are available at minimal or no cost to them through classes such as website and social media instruction.

A training program, or entry-level "Broadband 101" course, could be used to give small and medium businesses and other community institutions an introduction on how to capitalize on broadband connectivity, as well as more advanced applications for IT staff. In addition, training should include resources for non-IT staff, such as how to use commerce tools for sales, streamline finances with online records, or leverage knowledge management across an organization. Additional training might include:

- "How-to" training for key activities such as online collaboration, search optimization, cybersecurity, equipment use, and Web 2.0 tools.

- Technical and professional support for hardware, software, and business and organizational operations.

- Licenses for business applications such as document creation, antivirus and security software, and online audio and videoconferencing.

- Website development and registration.

- Basic communications equipment, such as low-cost personal computers and wireless routers.

Benefits:

- Provides entrepreneurial support.

- Helps community institutions operate more efficiently.

- Eliminates knowledge gap about how best to utilize broadband tools, increasing productivity.

- Promotes business growth and workforce development.

- Empowers small businesses to achieve operational scale more quickly by lowering start-up costs through faster business registration and improved access to customers, suppliers, and new markets. According to Connect Nevada's 2014 Business Technology Assessment, Nevada businesses that are using the Internet bring in approximately $160,000 more in median annual revenues than their unconnected counterparts.

Action Items:

- Identify federally or state sponsored business support programs (e.g. Chamber of Commerce, SBA, EDA, agriculture, or manufacturing extension) that include assistance with broadband or IT content.

- Work with the local chamber and/or the libraries to expand on existing programs that promote e-commerce, such as free websites and social media development.

- Identify or develop a business/community institution awareness and training program.

- Partner with providers to sponsor workshops.

- Identify or develop online training modules. For example, the Southern Rural Development Center, in partnership with National Institute of Food and Agriculture, USDA, administers the National E-Commerce Extension Initiative. As the sole outlet nationally for e-commerce educational offerings geared at Extension programming, the National

E-Commerce Extension Initiative features interactive online learning modules. In addition, the program's website offers a library of additional resources and a tutorials section for greater explanation on website design and function. Modules and presentations include: A Beginner's Guide to E-Commerce, Doing Business in the Cloud, Electronic Retailing: Selling on the Internet, Helping Artisans Reach Global Markets, and Mobile E-Commerce. Examples can be found at: http://srdc.msstate.edu/ebeat/small_business.html#.

3.3 Provide adequate bandwidth to all community mental health facilities in Nevada in order to support sufficient telemedicine and other institutional needs.

Mission and Mandate: Connect mental health facilities, particularly in rural parts of Nevada, to broadband in order to ensure the safety, health, and efficient operations for employees and clients.

For mental health facilities in Nevada, the need to connect to broadband is crucial for the operational efficiency, success, and safety of the institutions. Due to the remote location of many of these facilities, access struggles remain an infrastructural challenge. In addition to basic access, mental health facilities require adequate bandwidth capacities for a myriad of uses including telehealth, medication management, initial assessment, and medical records.

Action Items:

• Work with the state of Nevada to map current broadband capacities for all mental health facilities in the state.

• Identify bandwidth needs based on the mental health facility's size and uses.

• Partner with providers to identify potential solutions for bringing broadband to even the most rural of these areas.

• Serve the state's correctional facilities by ensuring broadband and telemedicine capabilities are available for inmates.

INCREASING BROADBAND UTILIZATION IN NEVADA AMONG KEY SOCIETAL SECTORS

4.1 Connect all K-12 school classrooms to the Internet in order to facilitate implementation of the Nevada Department of Education's Nevada Ready 21 Plan prioritizing technology-rich learning.

Mission and Mandate: Facilitate the connection of all classrooms to broadband Internet so that teachers and students can take full advantage of global educational resources such as those outlined in the Nevada Ready 21 plan (see Appendix 2). Prioritize an educational plan centered on technology learning, such as STEM education, by enabling effective 1:1 use among students.

A K-12 broadband network should provide adequate performance and reach, including abundant wireless coverage in and out of school buildings. "Adequate" means enough bandwidth to support simultaneous use by all students and educators anywhere in the building and the surrounding campus to routinely use the Web, multimedia, and collaboration software. To reach the goal of sufficient broadband access for enhanced K-12 teaching and learning and improved school operations, the State Educational Technology Directors Association (SETDA) recommends that broadband speeds in schools should equate to a minimum of 100 Kbps per student/staff. However, given that bandwidth availability determines which online content, applications, and functionality students and educators will be able to use effectively in the classroom, additional bandwidth will be required in many, if not most, K-12 districts in the coming years.

In order to evolve with technology, school districts must continue to update local educational policies and curriculum, assess their broadband and classroom technology needs, evaluate the professional development requirements of teachers, and provide tech support.

With the proper connections available to classrooms, the implementation of the Nevada Ready 21 plan will be more efficiently completed. Nevada Ready 21 transforms K-12 education by engaging all students in a personalized, learner-centered education. By purposefully infusing technology into students' daily experience, Nevada Ready 21 teachers will provide students with a twenty-first century education that builds a vibrant, diverse economy. Without serious and significant investment in curricula, long-term professional development, and the technology and infrastructure that support the development of these skills, our schools face the impossible challenge of developing twenty-first century students within a twentieth century educational system.

Benefits:

- Students are trained by skilled educators who value connected, personalized, student-centered learning.

- Students have continuous access to a personal, portable device that is connected wirelessly to the Internet.

- Students can actively utilize school computers to access rich, multimedia-enhanced educational content and the Internet.

- Students can post their content (including audio and video podcasts) to school learning management systems, access their e-textbooks and get their assignments online, and collaborate daily across the network with other students via wikis and other Internet-based applications.

- Teachers can videoconference or download streaming media to classrooms and take their students on virtual field trips to interact with subject-area experts.

- School systems can use online courses.

- Teachers can actively participate in online professional learning communities to share lessons and to participate in professional development.

- School systems can increase learning time by extending learning beyond the classroom walls.

- School systems can foster Individualize learning and increase student engagement in school.

- School systems can encourage self-directed learning.

- School systems can enable parents to more effectively support their children at home.

Action Items:

- Assess current and future bandwidth needs.

- Utilize E-Rate funding. E-Rate is the commonly used name for the Schools and Libraries Program of the Universal Service Fund, which is administered by the Universal Service Administrative Company (USAC) under the direction of the Federal Communications Commission (FCC). The program provides discounts to assist most schools and libraries to obtain affordable telecommunications and Internet access. Funding is requested under four categories of service: telecommunications services, Internet access, internal connections, and basic maintenance of internal connections. Discounts for support depend on the level of poverty and the urban/rural status of the population served and range from 20% to

90% of the costs of eligible services. Eligible schools, school districts, and libraries may apply individually or as part of a consortium.

- If broadband capacity is lacking at the local level, seek partnerships with other local high-capacity demand institutions, including local civic leaders, government entities, public safety agencies, libraries, and hospitals or clinics, in a coordinated effort to aggregate local demand needs for increased broadband capacity and service. By aggregating demand within a local community, these institutions will be able to demonstrate to interested broadband providers existing pent-up demand and help justify private investments to bring greater capacity backhaul service to that community. That increased backhaul capacity can in turn benefit the entire community.

- Follow timeline and recommendations set forth in Nevada Ready 21 for development of 8 defined areas for a successful education technology program: infrastructure, instruction, professional development, communication, leadership, advancement of a state program team, evaluation and assessment, and finance.

4.2 Promote telemedicine expansion statewide, particularly in rural areas.

Mission and Mandate: Deliver improved healthcare services to rural residents. Project should aim to promote the delivery of healthcare services from a distance using video-based technologies. Telemedicine can help to address challenges associated with living in sparsely populated areas and having to travel long distances to seek medical care – particularly for the elderly or patients with chronic illnesses. It also addresses the issue of the lack of medical specialists in remote areas by awarding access to specialists in major hospitals situated in other cities, states, or countries. While telemedicine can be delivered to patient homes, it can also be implemented in partnership with local clinics, libraries, churches, schools, or businesses that have the appropriate equipment and staff to manage it. The most critical steps in promoting telemedicine are ensuring that patients and medical professionals have access to broadband service, understand the main features of telemedicine, are aware of the technologies required for telemedicine, and understand how to develop, deliver, use, and evaluate telemedicine services.

One relevant funding opportunity includes the Distance Learning and Telemedicine Loans and Grants Program. USDA provides loans and grants to rural community facilities (e.g., schools, libraries, hospitals, and tribal organizations) for advanced telecommunications systems that can provide

healthcare and educational benefits to rural areas. Three kinds of financial assistance are available: a full grant, grant-loan combination, and a full loan. Connected Nation has offered tools to the Governor's Telemedicine Working Group over the last several months, including maps indicating medical facilities and available connections. The data collected includes both publicly available and confidential information on network location and capacity. The Governor's Telemedicine Working group is thus using this analysis to identify both gaps and solutions for connecting important medical facilities across the state. This work demonstrates how a solutions-oriented, public-private broadband mapping initiative can improve the quality of life for Nevadans that a reliance on existing public resources alone would not necessarily have achieved. For an example of this work, see Appendix 1.

4.3 Build off the progress of the Connected program by implementing permanent, community-based Technology Awareness Programs.

Mission and Mandate: Organize, promote, and deliver a technology awareness program that would increase utilization of technology resources in the community.

Project should conduct an extensive advertising campaign to raise awareness about the benefits of broadband and related technology. Develop a strategy to help the community become more aware of the benefits associated with Internet and computer adoption in their daily lives and activities. Methods of delivery include, but are not limited to, classroom style awareness sessions, press conferences led by community leaders, having a speaker at a community event, posting community posters, handouts, and public service announcements.

Additionally, the campaign should specifically target technology non-adopters. By using established media, the campaign reaches non-adopters where they are. Public radio, broadcast and cable TV, utility bill stuffers, and print newspapers have been utilized to reach households of many types. The public awareness campaign should focus on helping residents, particularly those from underserved communities, understand the personal value they can derive from an investment in information technology.

There are also opportunities to leverage existing resources to expand and enhance workforce-training programs, encourage more post-secondary education, and create additional awareness within the community in regards to global resources. It is important to support the outcomes of awareness training with the development of technology training programs that will then teach community members how to use the technology.

Benefits:

• Success is achieved when a community experiences increased usage of computers and the Internet, improved basic computer skills, increased use of technology in day-to-day operations of a community, and increased access to economic opportunities.

Action Items:

• Determine the type of public awareness campaign that is appropriate for your community. Connect Ohio's statewide Every Citizen Online public awareness campaign provides an excellent case study of a professionally developed campaign.[16]

• Create a centralized technology portal/website that promotes local technology resources for use by residents. Resources would include calendars (promoting local tech events and showing available hours at public computing centers), online training resources, and local computer resources.

ESTABLISHING PRIORITIES FOR STATE POLICY

Following the workshops in Reno and Las Vegas, workshop attendees and Nevada Broadband Task Force members were asked to prioritize the solutions mentioned above. Below are the results of those rankings showing that the number one issue these leaders find of highest priority is the establishment of an Office of Broadband Coordination, followed by public safety and education improvements.

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[16] Connect Ohio Public Awareness Campaign, http://connectohio.org/public-awareness-campaigns.

SOLUTION PRIORITIES FOR STATE POLICY

AVERAGE SCORE	IMPLEMENTATION	ACCESS	ADOPTION	SOCIAL USE
5	Create and fund an Office of Broadband Coordination			
5.2		Improve public safety communications through broadband		
5.6				Connect all Nevada K-12 school classrooms to the Internet
5.8	Re-charter a multi-stakeholder State Broadband Task Force			
5.9		Analyze local policies and ordinances for conduciveness to broadband build-out and analyze federal and state coordination		
6.3		Ensure ready and cost-effective access to poles, ducts, conduits, and rights-of-way		Promote telemedicine expansion
7.2		Continue to map growth in broadband creating more detailed maps		
7.7		Establish a statewide dig once policy		
8.5		Establish state funding or match dollars to support broadband deployment and maximize federal opportunities		
8.6			Incorporate business and zoning information into broadband maps	
9.8			Develop or identify broadband training and awareness programs for businesses, CAIs, and other institutions	
11.5			Provide adequate bandwidth to all community mental health facilities	
11.8				Implement permanent, community-based technology awareness programs
11.9		Complete a vertical assets inventory		

LOCALLY BASED INITIATIVES

In the course of the Connected Assessment program, a number of communities took the discussions spurred by the Community Engagement process and created locally based initiatives and customized solutions to implement. This section highlights a number of those local projects along with other project suggestions that have been regarded by communities as future next steps and best practices for their areas, beyond the Connected Nation recommended items.

Broadband Access: Creation of a multi-county broadband purchasing consortium (Humboldt, Lander, and Pershing counties)

GOAL:
To identify the most credible and reliable broadband provider to serve the region's households and businesses through an RFP (request for proposals) process as a tri-county consortium to maximize buying power.

PROJECT DESCRIPTION:
The broadband committee, comprised of representatives of the counties of Humboldt, Lander, and Pershing, recommend to County Commissioners the consideration for implementation of this multi-county consortium. The consortium should be led by the three county governments, which would commit to a contract guarantee for a service provider to serve three counties (Humboldt, Lander, and Pershing). The guarantee of the consortium would allow for these communities (counties) to break into the heretofore-inaccessible fiber running through the I-80 corridor. Currently, this can be done at a very high cost to facilitate FTTP, or can be done in collaboration with WISPs (including fixed wireless providers). By creating the consortium-backed guarantee, the incentive is in place for a true broadband investment to be made. Thus, the local anchors are better capable of serving their citizenry. Local retail providers are given access to an alternative provider. In short order, fiber-fed broadband can serve not only the anchors, but also local WISPs, resulting in small business and residential customers being able to enjoy broadband on the same level as places like Reno and Las Vegas.

BENEFITS:

• By increasing speeds and access, this project would create a credible and reliable broadband consortium within these three counties to serve the residents and businesses. It would also provide the much-needed redundancy in these communities.

ACTION ITEMS:

• Establish a consortium within the counties to work with local county officials to facilitate fiber-fed broadband to CAI, local providers, and residents.

• Consider opportunities for leveraging community assets to promote broadband deployment.

• Develop a system of communication through single points of contact to providers regarding city/county planning initiatives.

• Identify all providers in the area, including contact names, service territory, and available speeds.

• Invite providers and local customers to ongoing technology meetings, identifying resources and challenges for both the community and providers.

09 / MULTI-COUNTY BROADBAND MAP

Legend:
- ⊙ City
- —— Interstate
- —— US Road
- ---- Municipal Boundary
- ——— County Boundary
- Water
- National and State Lands
- Fiber Broadband Available
- Cable Broadband Available
- DSL Broadband Available
- Fixed Wireless Broadband Available
- Unserved Areas
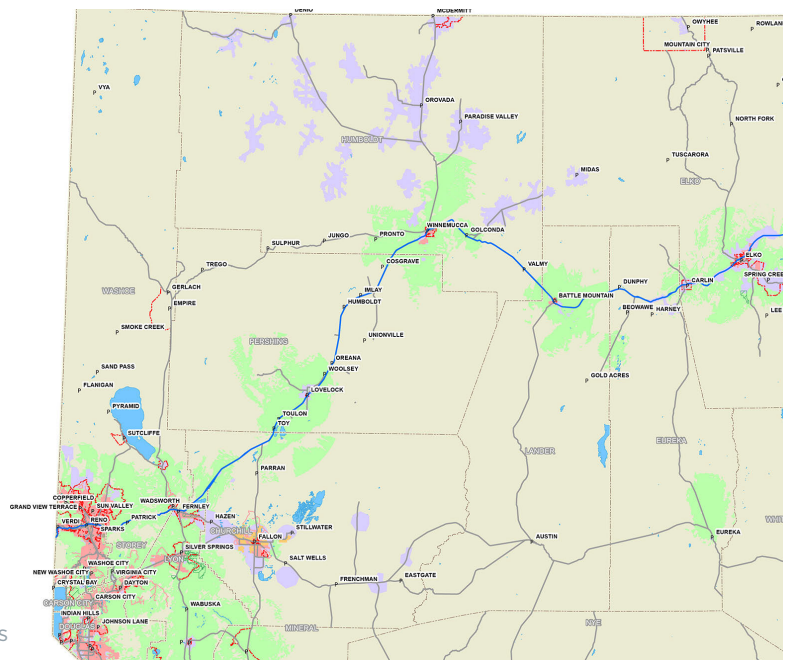
Broadband Access: Mineral County School District Internet Bandwidth Upgrade

GOAL:
The overall goal is to upgrade the Internet bandwidth in the School District to at least 12-18 Mbps or higher to accommodate faster connections for web-based applications, including but not limited to, MAPT testing, Teacher YouTube, PowerSchool, SmartBoards, etc.

PROJECT DESCRIPTION:
The Mineral School District plans to implement several web-based applications that will be hosted on the Internet. Its current Internet connection is limited to less than 5 Mbps download speed.

BENEFITS:
• Generate efficiency and cost savings by moving several applications to hosted services.

• Improve the level and quality of instruction and education in the school district.

• Improve capability for online instruction and learning in the Special Education Department (includes Compass Learning and Lexia to aid in the alternative education sessions).

ACTION ITEMS:
• Finalize contract with AT&T regarding the service.

• Execute the implementation plan as follows:

– Install 12 Mbps (AT&T Uverse service) line at the Hawthorne Elementary School by early December.

– Upgrade/install two other lines with AT&T (i.e., 12 Mbps in the school district office and 18 Mbps at the high school by winter break).

Broadband Adoption: Community Free Wi-Fi

GOAL:
Offer free Wi-Fi access in local tourism hotspots to encourage visitors to interact with local communities/governments and to increase economic footprint of tourism dollars.

PROJECT DESCRIPTION:
Offer free Wi-Fi through partnerships with local providers and businesses, allowing tourists to interact with communities and to access the Internet. In some cases, free Wi-Fi can also enable events and other activities in the town. For example, in Genoa, Nevada mobile access for vendors at the local Candy Dance is incredibly important to process payments.

The following communities have identified free Wi-Fi as a priority:

• Genoa, NV

• Downtown Minden/Gardnerville

• Lovelock, NV County Courthouse and Surrounding Community Park

ACTION ITEMS:

• Identify a provider that would be willing to install, support, and maintain the equipment required either through an RFP or through a local partnership.

• Identify a funding mechanism for the Wi-Fi network.

• Establish the exact areas to be covered.

• Support construction of the project and market the location as a Wi-Fi hotspot.

Broadband Adoption: Promote Computer Refurbishment or Recycling Programs

GOAL:
Promote and support existing computer refurbishment and recycling programs in order to expand broadband adoption in communities.

PROJECT DESCRIPTION:
Several communities in Nevada have established locally-based computer refurbishment and recycling programs, which assist in and promote broadband and technology adoption. According to Connected Nation's residential survey, approximately 119,000 Nevada households do not have a computer or device with which to access the Internet, and cost of any such device can be a barrier to adoption. These private efforts should be encouraged and promoted as opportunities to help bridge the broadband adoption gap in Nevada.

Computer refurbishment programs are often designed to help recycle computers donated by local businesses, government, schools, and other organizations, and then distribute them to low-income households and other households that face affordability barriers to computer ownership. Alternatively, community recycling programs help to reduce the amount of hazardous materials that may enter the environment.

BENEFITS:

• Computer refurbishing programs have shown to be an excellent work force training tool for correctional facilities, young adults, and the mentally and physically challenged. The correctional facility program trains inmates with computer skills that should help them find jobs upon their release.

• The process by which computers and other electronic equipment are refurbished or broken down to their basic parts is called demanufacturing. This helps conserve energy and raw materials needed to manufacture new computers and electronic equipment. These parts are then reused in upgrading other computers.

ACTION ITEMS:

• Support existing computer refurbishment and recycling programs.

• Develop a model for new computer refurbishing or recycling. A basic framework might include:

 – Project Planning – Determination of minimum computer specifications; acquisition and storage of donated computers; determination and installation of appropriate computer operating system; calculation of costs needed to carry out the program.

 – Inventory Management – Examine how equipment and software will be sorted and managed; manage inventory by identifying computers that are ready to be refurbished from those that are non-functioning.

 – Volunteer Training – Review established residential refurbishment and recycling programs that the community can take advantage of such as Dell's Reconnect program, Earth 911, and Electronic Industries Alliance's Consumer Education inititative.

Broadband Adoption: Computer Literacy and Social Networking Classes in Eureka Senior Centers

GOAL:
Provide classes and training to improve computer literacy and teach social networking to senior clients at designated centers. Chosen senior centers include Eureka Senior Center in Eureka and Fannie Komp Senior Center in Cresent Valley.

PROJECT DESCRIPTION:
Create computer training programs and classes for seniors at the centers.

ACTION ITEMS:
- Create goals/objectives for the training program.
- Identify current statewide/local training opportunities for a possible partnership.
- Solicit funding for the program through grants.
- Set up computers and facilities for training.
- Find qualified trainers.
- Create training calendar.
- Market training to target audience.

SUPPORTING EXISTING LOCAL PROJECTS

Through the planning process many ongoing community broadband projects were identified. The local planning teams quickly realized supporting, understanding, and communicating the local projects was a top priority.

By supporting providers and community projects, community leaders realized they could encourage timely progress, maximize local resources, and create relationships of collaboration carrying into the future. In some cases this may lead to a reduction in cost for both infrastructure deployment and service to residents. Additionally, this will allow for a clear communication channel between residents, community leaders, and providers.

To support these current broadband projects, communities aim to:

- Identify all providers/projects in the area, including contact names, service territory, and available speeds.

- Invite providers and local customers to ongoing technology meetings, identifying resources and challenges for both the community and providers.

- Consider opportunities for leveraging community assets to promote broadband deployment, especially among community anchor institutions.

- Develop a system of communication through single points of contact to providers regarding city/county planning initiatives.

These projects include the following:

Eastern Nevada Food Bank (ENFB) serving White Pine

GOAL:
Support ENFB through the use of technology (where appropriate) to maximize the sourcing and distribution of healthy food resources. This includes support and collaboration in the following areas:

- Humanitarian healthy food distribution.

- New job creation for low-income veterans and families.

- Youth and adult education in agricultural and business management practices.

- Social disorder and judicial community service support.

PROJECT DESCRIPTION:
ENFB is a new organzation with the objective of achieving sustainability in rural communities that lack healthy food choices. As a Nevada non-profit, the organization has been established as a Community Development Corporation (CDC). As a CDC, it will provide programs, offer services, and engage in activities that promote and support community development. Local leaders should support the development of this organization, using technology as a catalyst for change to further develop the food network and assist in fundraising efforts.

Lincoln County School District Technology Upgrade Projects

GOAL:

To prepare Lincoln County School District for new growth needs in all areas of technology in order to create a better learning environment that is collaborative and meaningful for the students. Additionally, to facilitate communications within the school system as part of the Lincoln County School District Emergency/Crisis Management Plan.

PROJECT DESCRIPTION:

Overall technology upgrades in all schools of the Lincoln County School District to prepare for future needs and requirements including state-required online reporting and assessment (e.g., Smarter Balanced Assessment Consortium; NRS required teacher evaluation system).

BENEFITS:

- Improve the level and quality of education in all schools in the Lincoln County School District.

- Technology will support both teaching and learning in the classrooms (e.g., expanded course offerings and better learning materials; increased student engagement and motivation).

Action Items:

- Placement of new computer servers to accommodate needs.

- Installation and upgrades of wireless access points in each school.

Lincoln County Telephone System Fiber Cable Placement Project

GOAL:

To replace an aging copper plant in Lincoln County to enable increased broadband speeds in the county.

PROJECT DESCRIPTION:

Outside plant construction of a fiber line in order to expand service areas and increase broadband speeds by December 2013.

BENEFITS:

- Improve quality of service and customer satisfaction.

ACTION ITEMS:

- Install fiber 40 miles from Pioche to cover Dry Valley and Rose Valley.

- Install additional 14 miles of fiber between Panaca and Caliente.

Mt. Grant General Hospital Acute Hospital Electronic Health Record (EHR)

GOAL:
Participate in the Medicare and Medicaid Incentive Program under the American Recovery and Reinvestment Act (ARRA) that allows eligible hospitals to adopt, implement, upgrade, and demonstrate meaningful use of certified EHR Technology.

PROJECT DESCRIPTION:
Mt. Grant General Hospital decided to participate in the American Recovery and Reinvestment Act's Electronic Health Record Program. EHR is an evolving concept defined as a systematic collection of electronic health information about individual patients or populations. It is a record in digital format that is theoretically capable of being shared across different healthcare settings. In some cases this sharing can occur by way of network-connected, enterprise-wide information systems and other information networks or exchanges. EHRs may include a range of data, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, vital signs, personal statistics like age and weight, and billing information.

BENEFITS:

- EHR improves the ability of the hospital to provide healthcare because the system is designed to capture and represent data that accurately capture the state of the patient at all times.

- It allows for an entire patient history to be viewed, thereby eliminating the need to track down the patient's previous medical record.

- It reduces data replication, as there is only one modifiable file that can constantly be viewed and updated.

- It minimizes the issue of lost forms or paperwork.

ACTION ITEMS:

- Identify and review potential EHR implementation and Meaningful Use (MU) timelines.

- Verify PECOS enrollment for 291300 and 292300.

- Calculate Medicare incentive funding estimates.

- Calculate MGGH CAH Medicaid Utilization (must be at least 10% or more).

- Analyze MU Stage 1 and Stage 2 deadlines and impact on the EHR implementation.

- Register with CMS in preparation for MU attestation.

- Attest with CMS after 90-day attestation period has been completed.

- Receive incentive payment from Medicare.

PROJECT SUCCESSES

In addition to the various project plans identified in communities, local community planning teams across the state experienced a myriad of successes as a result of bringing leaders around the table to talk about broadband in a comprehensive fashion. These community broadband successes have been documented below.

Eureka County Bandwidth Upgrade

GOAL:
To upgrade the bandwidth for the county LAN by 5-fold in order to make online resources more useable and accessible to rural residents and county government officials.

PROJECT DESCRIPTION:
A county-wide initiative to improve not only availability, but the quality of broadband for residents and local government through fiber build-out funded by Eureka County.

ACCOMPLISHMENTS:
The county completed construction of the project July 2013.

ROLE OF CONNECT NEVADA:
Connect Nevada facilitated conversations between local county officials and national providers with technical support and contacts.

Esmeralda County School District Network Upgrade

GOAL:
To upgrade the school district's Internet/data network in order to accommodate distance learning and provide better Internet access in the schools.

PROJECT DESCRIPTION:
The school district needed to increase its bandwidth to be able to implement more advanced technology and computer applications, including a 1:1 program.

ACCOMPLISHMENTS:
Implemented a 10 Mbps VLAN in the three ECSD K-8 elementary schools in Goldfield, Dyer (Fish Lake Valley), and Silver Peak and replaced outdated bonded T-1 connections for ECSD.

ROLE OF CONNECT NEVADA:
Connect Nevada facilitated initial conversations between ECSD and local provider Arizona Nevada Tower Corporation (ANTC) which resulted in an RFP, a proposal, and changes to the ANTC project to accommodate education facilities.

ANTC Fish Lake Valley (Dyer) Project

GOAL:
Provide robust community broadband service to Fish Lake Valley (Dyer) through a BIP project awarded to Arizona Nevada Tower.

PROJECT DESCRIPTION:
Part of Arizona Nevada Tower Corporation's Broadband Initiative Program in 30 communities across central Nevada. The project is currently in progress with an estimated completion date within the final quarter of 2014.

ACCOMPLISHMENTS:
BLM approval and beginning construction of the project.

ROLE OF CONNECT NEVADA:
After ANTC ran into permitting and Environmental Assessment issues, Connect Nevada facilitated several meetings and ongoing reports to resolve the issues and allow ANTC to get back on schedule for construction in 2014.

Baker, NV Mobile Access Project

GOAL:
Expand mobile access to Baker, Nevada while at the same time providing for the development of a more robust fixed wireless network.

PROJECT DESCRIPTION:
Baker, a small community east of Ely, is lacking a robust network for mobile access. This lack of infrastructure impacts public safety as well as the economic vitality of a community reliant on tourism dollars (Great Basin National Park). Baker has been working tirelessly for some time to identify a solution to this problem. The technology team, in collaboration with Connect Nevada, worked to identify a potential provider willing to expand both mobile broadband and fixed wireless broadband through collocation.

ACCOMPLISHMENTS:
Connect Nevada identified a provider, Commnet, and facilitated the construction of a tower for the town of Baker. The tower was completed early 2014, offering mobile access and an opportunity for collocation for Beehive Wireless. Great Basin National Park now plans to offer additional educational resources for the park via mobile applications.

ROLE OF CONNECT NEVADA:
Connect Nevada held initial meetings with community members, identified a provider, facilitated meetings, and initiated agreements between the two parties.

Lund, NV ANTC Broadband Project

GOAL:

Leveraging existing assets and current projects, the White Pine technology team will facilitate high-speed broadband access to 100% of residences and businesses, provide free basic Internet service to 100% of community anchor institutions, and provide a Personal Computing Center (PCC) operated at no cost to Lund for 24 months.

PROJECT DESCRIPTION:

Utilizing a new tower that is being constructed near the center of town along with fiber-fed TDM circuits available from the ILEC, ANTC – through its subsidiary, AtomSplash – will deliver high-speed access with download speeds up to 6 Mbps for every business and residence in the town of Lund. Leveraging the resources of TAG and ANTC's proven track record for securing Community Connect grant funding, ANTC will apply for (and expects to be awarded) the contract to support the deployment of fixed terrestrial wireless Internet to every home and business interested in subscribing to service. In addition, ANTC will construct and operate a PCC containing 10 computers for the community for no less than 24 months, free Internet access to those residents who do not elect to subscribe to the commercial service, as well as a free local Wi-Fi hotspot. Further, all local community anchor institutions will receive free basic Internet service during the same 24-month period.

ACCOMPLISHMENTS:

In partnership with Arizona Nevada Tower and the local technology team, a Community Connect grant was secured for Lund in 2013.

ROLE OF CONNECT NEVADA:

Connect Nevada coordinated the White Pine planning meetings and further coordinated the discussions that led to the partnership between White Pine Economic Development and Arizona Nevada Tower.

Genoa, NV Community Wi-Fi Project

GOAL:

Offer free Wi-Fi access in local tourism hotspots in Genoa, Nevada to encourage visitors to interact with the local community/government and to increase economic footprint of tourism dollars.

PROJECT DESCRIPTION:

Offer free Wi-Fi through partnerships with local providers and businesses, allowing tourists to interact with the community and to access the Internet. In Genoa, mobile access for vendors at the Candy Dance is incredibly important to process payments and to communicate with public safety officials.

ACCOMPLISHMENTS:

Douglas County created a solution for connectivity at their annual Candy Dance event (utilizing a C.O.W.S.) and is now looking at creating a permanent, open access Wi-Fi network for the town of Genoa. The town of Genoa lacks mobile coverage, which only grows exponentially with events hosted by the town as a result of the increase of visitors and the increase of transactions via mobile devices. The town has sought county redevelopment funds to initiate creation of an engineering plan and to create an RFP for local providers.

ROLE OF CONNECT NEVADA:

Connect Nevada hosted town meetings to discuss the issue, provided expertise, and contributed to the "findings" document to solicit funds from the county redevelopment agency.

Douglas County Speed Test Contest

GOAL:

Create a more detailed map for the community regarding available speeds, enabling the technology team and community stakeholders to better understand the broadband landscape and to address residential concerns anecdotally gathered at local technology team meetings. This also allows communities to initiate informed discussions with local providers to assist in addressing gaps in coverage and potential build out plans.

PROJECT DESCRIPTION:

Encourage residents to participate in data contribution through county-level speed testing, in order to validate available speeds of local providers and to better understand adoption trends among residents. Results from these speed tests can contribute to an overlay of broadband availability and show clusters of speed trends in a given area.

ACCOMPLISHMENTS:

Douglas County, in partnership with Arizona Nevada Tower, hosted a speed test contest over a 3 month period encouraging residents to perform speed tests from their homes. An iPad was awarded to one participant. The contest then gave the community additional data points, which were overlaid on a residential availability map. This map was used by the local technology team to discuss availability and adoption rates of residents.

ROLE OF CONNECT NEVADA:

Connect Nevada coordinated marketing of the contest, collected the data, and mapped the data for the team.

Douglas County Industrial and Commercial Overlays

GOAL:

To better understand business and industrial broadband access in Douglas County.

PROJECT DESCRIPTION:

In coordination with county GIS, collect and display industrial and commercial zones on the residential availability map. This map will be used by the local technology planning team to examine industrial and commercial access for both current businesses and future economic development opportunities.
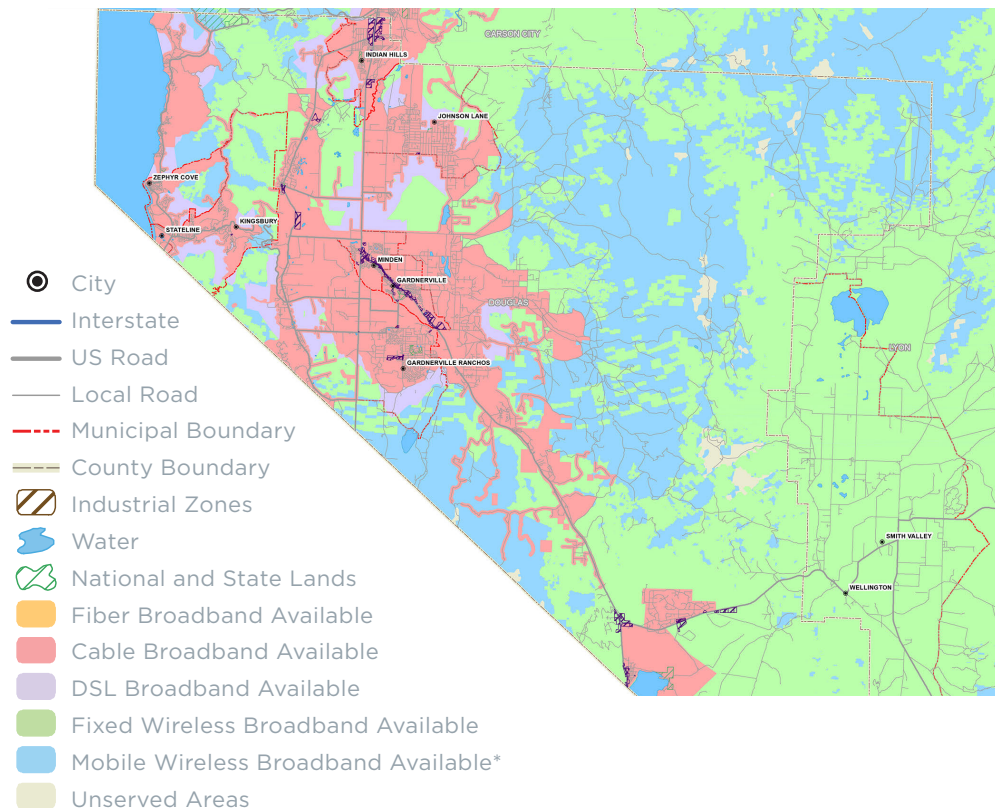
ACCOMPLISHMENTS:

A map was created for use by the local planning team to examine the industrial and commercial zones, and is now being used by the local economic development authority to inform the planning process.

ROLE OF CONNECT NEVADA:

Connect Nevada coordinated GIS data coordination between Connected Nation and Douglas County GIS and mapped the resulting data for use by the local technology team.

10 DOUGLAS COUNTY BROADBAND MAP

- ⊙ City
- — Interstate
- — US Road
- — Local Road
- --- Municipal Boundary
- === County Boundary
- ▨ Industrial Zones
- Water
- National and State Lands
- Fiber Broadband Available
- Cable Broadband Available
- DSL Broadband Available
- Fixed Wireless Broadband Available
- Mobile Wireless Broadband Available*
- Unserved Areas

Storey County Government Access

GOAL:
To increase speeds to county government administrative buildings and to make those connections more reliable for business use.

PROJECT DESCRIPTION:
Identify an alternative provider to create competition, to facilitate faster speeds, to reduce costs and to create a more reliable connection for local government use.

ACCOMPLISHMENTS:
At a local technology planning meeting, it was discovered that county government's connection speeds were slow, unreliable, and expensive. Arizona Nevada Tower recognized it could serve the county via a tower located at USA Parkway. Arizona Nevada Tower put together a proposal for the county which ended up saving the county a significant amount of money, for a more reliable, faster connection.

ROLE OF CONNECT NEVADA:
Connect Nevada facilitated the local planning meeting and identified Arizona Nevada Tower as a potential provider for the location.

Additional Successes

- At a local planning meeting in Nye County, where broadband access issues were identified, a resident decided to start a fixed wireless company to serve Pahrump, Nevada called Wave Direct (now Jab Wireless).

- At the Nevada Broadband Summit 2012, S.W.I.T.C.H agreed to serve as a broker for local ISPs in Nevada, dramatically decreasing the cost per Mbps for local providers.

- Connect Nevada supplied feedback and facilitated meetings to redevelop the White Pine County website in order to be more inclusive of the county tourism and government resources.

APPENDICES

APPENDIX 1: TELEMEDICINE MAP

LEGEND

◆	NVIT SITE - Digital Only
●	Hospitals / Clinics
⬟	Behavior Facilities
■	Correctional Facilities
•	City
—	Interstate
—	US Highway
—	NHA/EITS Fiber
—	NHA/NV Energy Poles
—	NHA Fiber Only
—	NHA/VEA SWAP
—	EITS DS3 (155 Mbps)
—	EITS OC3 (45 Mbps)
- - -	Exsisting Fiber Route
▨	Tribal Lands

APPENDIX 2: NEVADA READY 21 PLAN

NEVADA READY 21:

IGNITING ECONOMIC DEVELOPMENT THROUGH STUDENTS' 21ST CENTURY SKILLS

NEVADA COMMISSION ON EDUCATIONAL TECHNOLOGY
SEPTEMBER 2014

MEMBERS OF THE COMMISSION ON EDUCATIONAL TECHNOLOGY

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Patricia Miller	Community volunteer/TMCC
PG Schrader	University of Nevada, Las Vegas
Rob Campbell	Cisco Systems
Robert Sidford	Washoe County School District
Ruben Murillo	Nevada State Education Association
Sarah Adler	USDA Rural Development
Sarah Negrete	Northern Nevada RPDP
Scott Bailey	Washoe County School District
Scott Lommori	Lyon County School District
Seonsuk Kim	Nye County School District
Spencer Watson	Education Superhighway

Steve Wells   Cisco Systems

Sue Chambers   Churchill County School District

Tammy McKeever   Cisco Systems

Tearra Bobula   Carson City School District

Terra Graves   Washoe County School District

Zachary Scott Robbins   Sedway Middle School

CONTENTS

Vision:

Nevada Ready 21 ignites economic development in Nevada by delivering a 21st Century workforce, and ensures equity for Nevada's students through personalized access to a connected, 21st Century education.

Mission:

To provide all Nevada students an equitable, technology-rich education that supports high standards, and an engaging learning environment, and the development of the 21st century skills students will need to fuel the economic growth of the state. Furthermore, *Nevada Ready 21* will support educators in their efforts to create more engaging and personalized instruction by providing the essential tools and the ongoing professional development to guide their transformation.

Definition of one-to-one student computing:

One-to-one computing provides students and teachers with 24 hour access to their own personal, portable, technology device connected wirelessly to the Internet.

For a video representation of what *Nevada Ready 21* could look like, click here.

EXECUTIVE SUMMARY

If Nevada's students are going to compete in the global marketplace, our education system must ensure students have the necessary skills to thrive in the digital age. *Nevada Ready 21* transforms K-12 education by engaging all students in a personalized, learner-centered education. By purposefully infusing technology into students' daily experience, *Nevada Ready 21* teachers will provide students with a 21st Century education that builds a vibrant, diverse economy. Without serious and significant investment in curricula, long-term professional development, and the technology and infrastructure that support the development of these skills, our schools face the impossible challenge of developing 21 century students within a 20th century educational system.

Every *Nevada Ready 21* student will have access to the two most important educational opportunities available:

1. Skilled educators who value connected, personalized, student-centered learning, and
2. Continuous access to a personal, portable device that is connected wirelessly to the Internet.

Every *Nevada Ready 21* educator will have on-demand access to sustained professional development, membership to a network of other innovative, *Nevada Ready 21* teachers, and essential tools for delivering an equitable, engaging, technology-rich educational environment that supports all students' learning and Nevada's economic development.

Nevada Ready 21 grew out of the *Nevada Ready!* initiative. *Nevada Ready!* is a statewide initiative led by the Nevada Department of Education and the Nevada Board of Education in partnership with the Nevada System of Higher Education, local school districts, as well as public and private organizations to raise awareness of the state's public school standards. The standards define what students are expected to learn and to be able to do as they move from grade to grade. Ensuring students reach and exceed Nevada academic content standards is at the core of *Nevada Ready 21.*

Nevada Ready 21 utilizes research findings and addresses Nevada's unique educational landscape to generate bold, focused educational transformation. Drawing from the successes of nationally recognized programs as well as from local Nevada programs, this is a plan that customizes proven accomplishments to Nevada's unique educational landscape. Most important, *Nevada Ready 21* ensures communication outreach specifically targets parents and caregivers. Schools will hold meetings and classes with parents to ensure they are informed partners of *Nevada Ready 21*.

The Nevada Ready 21 final product is described in the latter half of this plan. *Nevada Ready 21* includes devices, internal infrastructure, professional development for teachers and school administrators, parent outreach, internal evaluation, and program staff. This plan was developed by a team of state and national experts who focused on a set of key implementation factors identified by the One-to-One Institute. The planning committee designed the components of the key elements and assigned a *seat price* to those components that includes all of the components necessary to implement *Nevada Ready 21*. The seat price for each component can be multiplied by the number of students at a school to arrive at the estimated cost for implementation at that school.

Through the planning process, it became apparent that many of Nevada's rural schools lack the external infrastructure to implement *Nevada Ready 21*. As such, this plan also lays out the first steps for bringing this infrastructure up to par; however, deep analysis and planning are necessary to remedy the problem. Without adequate connections, many schools will never have the broadband capacity to implement *Nevada Ready 21*. However, *Nevada Ready 21* could serve as the impetus behind these much needed improvements.

RATIONALE

NEVADA READY 21: BUILDING A PREPARED NEVADA

If Nevada's students are going to be able to compete in this global marketplace our education system must ensure students have the necessary skills to thrive in the digital age. Information technology is transforming the global economy and drastically changing the way business and society operates. Learning how to locate and evaluate data in a sea of digital information, and then be able to use that information to learn independently, solve problems and make good decisions are critical skills for future success. Also learning to be flexible and creative in one's thinking, and to be able to effectively collaborate and work in teams are essential skills needed in the rapidly changing world. These are the 21st century skills that will be crucial for students to thrive in the digital age. Without serious and significant investment in curricula, long-term professional development, and the technology and infrastructure that support the development of these skills, our schools face the impossible challenge of developing 21 century students within a 20th century educational system.

Nevada Ready 21 transforms K-12 education by engaging all students in a personalized, learner-centered education. By purposefully infusing technology into students' daily experience, *Nevada Ready 21* teachers will provide students with a 21st Century education that builds a vibrant, diverse economy. Every *Nevada Ready 21* student will have access to the two most important educational opportunities available:

3. Skilled educators who value connected, personalized, student-centered learning, and
4. Continuous access to a personal, portable device that is connected wirelessly to the Internet.

Every *Nevada Ready 21* educator will have on-demand access to sustained professional development, membership to a network of other innovative, *Nevada Ready 21* teachers, and essential tools for delivering an equitable, engaging, technology-rich educational environment that supports all students' learning and Nevada's economic development.

THE *NEVADA READY!* INITIATIVE

Nevada Ready! is a statewide initiative led by the Nevada Department of Education and the Nevada Board of Education in partnership with the Nevada System of Higher Education, local school districts, as well as public and private organizations to raise awareness of the state's public school standards. The standards define what students are expected to learn and to be able to do as they move from grade to grade. Although standards are not new to education in Nevada, today's students are being taught under more rigorous standards that prepare them for college and the modern workplace, and places Nevada's education system on par with other high performing states. Virtually all of our state's education initiatives are built upon these standards - with the goal of increasing expectations of what our students will know and master to be college and career ready, and equipped to compete globally. Through a comprehensive communications strategy, *Nevada Ready!* will provide information to help educators, students, parents, community leaders and others understand the standards of education adopted by the Department and Board, the tests that will be given to assess student and teacher performance and ways to use those results to help students, educators, schools and school districts reach these new, rigorous standards.

NEVADA READY 21

Nevada Ready 21 grew out of the *Nevada Ready!* Initiative. An important piece of the *Nevada Ready!* modernization efforts comes from the effective integration of technology into the student learning process, and also the use of technology to achieve efficiencies throughout the education system. In November 2012, the Nevada Commission on Educational Technology approved *Digital-Age Education in Nevada: A Plan for 1:1 Computing in Nevada Schools* as its official plan for implementing a statewide one-to-one student computing program. Although the plan was unfunded, the Commission believed it was their responsibility to raise awareness of the impending and increasing need to offer Nevada students a digital-age, 21st Century education. The Commission believes the most cost-effective and educationally transformative way to accomplish this is through a statewide one-to-one program. Since 2012, the need for such a program has only increased as the demand for a technologically literate workforce has increased.

In August 2013, the Department was approached by a cadre of business partners wishing to sponsor the Department to work with advisers at the One-to-One Institute, the world's foremost organization on international one-to-one research and implementation. Although the 2012 plan was a good start, it lacked some key elements – most notably, a budget. After 6 months of strategic planning, nearly 50 representatives from different facets of the public and private sectors converged in Carson City in February of 2014 to begin revising the Commission's one-to-one plan. The following pages contain the product of that endeavor, *Nevada Ready 21*.

"Nevada stands at a crossroads, yet it appears ready to remap its future."
Mark Muro, Senior Fellow/Policy Director, Brookings Institute

Mr. Muro's prophetic statement in an economic development report in 2011 seems to echo the current condition of a number of Nevada's systems. In his report, Mr. Muro goes on to say that "the current economic slump has not been just a temporary reversal but a challenge to the state's traditional growth model." Among the key challenges Muro identifies are "spotty and weak innovation and technology…and substantial workforce skills shortfalls."

There are strong connections between the identified economic challenges and the state's education system. According to Education Week's State Report Cards for 2013, Nevada was ranked second to last in "Overall Grades and Scores," and last in students' "Chance for Success."

In a study published by the Education Alliance of Washoe County (2011), investigators found that Nevada has one of the nation's least educated workforces. Nevada ranks 43rd in educational attainment of its population, with only 21% of the state's population over 25 holding a Bachelor's degree or higher. Given Nevada's need for a more educated workforce, its low high school and college graduation rates become a major problem because the state will not produce enough qualified workers to meet demand. Remarkably, of 100 high school freshmen in Nevada today, only 10 will earn a college degree within the next 10 years.

Nevada also continues to face major challenges with closing the academic achievement gap. There is more than a 20 point difference between the achievement levels of black students vs. white students in all four tracked areas: 4th grade reading, 4th grade math, 8th grade reading, and 8th grade math. The results were similar for the achievement gap between Hispanic and white students. Although the state saw a significant closing in the gap in 8th grade math, the gap in the all four tracked areas still remains over 20 points.

In the most recent Milken Report of state rankings (Klowden & Wolfe, 2013), Nevada's overall technology rank was 47th. In 2010 Nevada was ranked 46th, 43rd in 2004, and 42nd in 2002. There is an obvious trend that indicates that the State continues to fall farther and farther behind the rest of the country. In addition to the Technology ranking, the level of Research and Development investment in Nevada places the State 49th, and Nevada ranks last in the category of Human Capital Investment.

These findings warrant immediate and dramatic action. The National Educational Technology Plan 2010 (NETP) states, "…we need revolutionary transformation, not evolutionary tinkering, and we know that transformation cannot be achieved through outdated reform strategies that take decades to unfold" (United States Department of Education Office of Educational Technology, 2010, p. 3). Technology can be a driver of this transformation, but only if 1) the appropriate content standards in place; 2) there is a major shift towards personalization in the instructional pedagogy; 3) the right policies are in place to allow for flexibility and personalization; 4) the teachers are adequately trained in how to transform their practices; and 5) a robust network and infrastructure are in place that allow the students and educators to maximize the potential of the technology.

One of the most important outcomes that grew out of the *Nevada Ready 21* planning process is the recognition that many Nevada schools lack the external infrastructure to carry out an effective one-to-one program. External infrastructure refers to the way in which a building connects to the internet and is referred to as the wide area network (WAN). Ideally, every school in Nevada would be connected through fiber-optic cable. WAN is different from the local area network (LAN) in that LAN refers to the network within the building and is comprised of such items as routers, switches, and wireless access points.

In October 2013, Nevada schools participated in State School Speed Test Month (SST) that was administered by non-profit Education Superhighway (ES) that tested the bandwidth speed of roughly 75% of Nevada schools. Of participating schools, 28% exhibited internet speeds that are ready for technology-rich, digital learning (Fig. 1) because the school met a minimum threshold of 100 kbps per student, a standards set by the State Educational Technology Directors Association (Fox, Waters, Fletcher & Levin, 2012). Another 39% of schools were identified to be in the *emerging reliance* category that has a capacity of 50-99 Kbps per student. These schools are on the brink of readiness for technology-rich digital learning, and with moderate upgrades would be ready to participate in a program such as *Nevada Ready 21*. The remaining 33% of schools will require many network upgrades to participate in *Nevada Ready 21*.
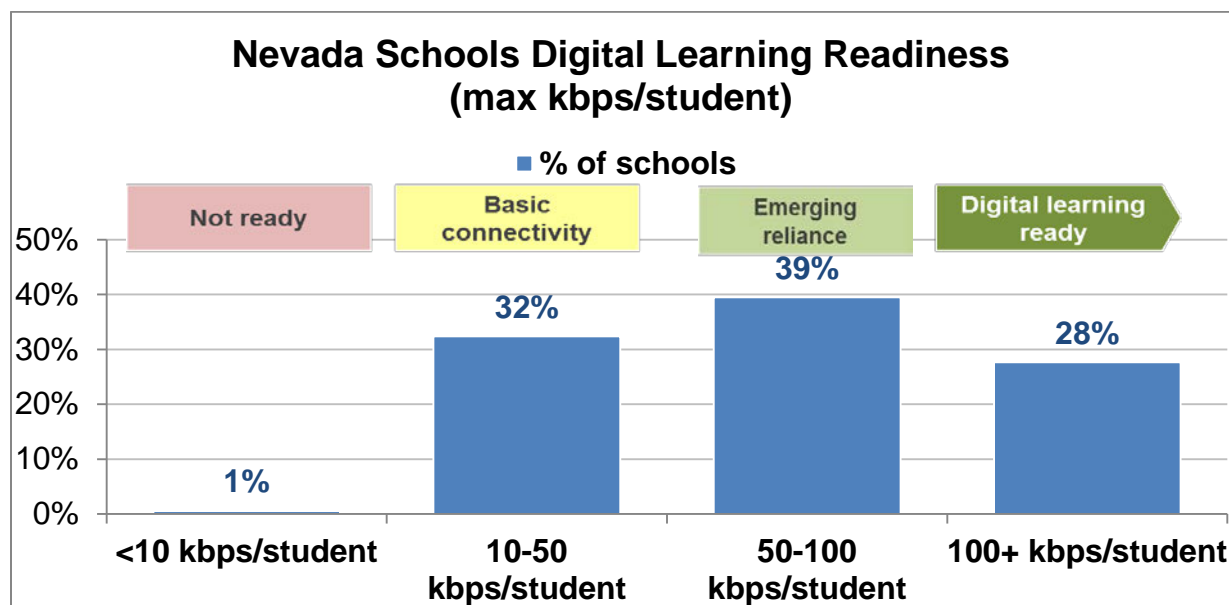

Fig 1. Nevada School Readiness for Digital Learning (Education Superhighway, 2013)

SST data revealed two trends (Education Superhighway, 2013). First, many rural schools lack access to high-speed broadband connectivity. The price of bringing high-speed service to rural and frontier schools is often cost prohibitive. Not only is the cost of installing the fiber-optic cable expensive, but then telecom companies typically lease the line back to the school, and that expense is often costly as well.   For instance, one rural school district was quoted over $1 million to run the fiber-optic cable to just two of its schools, and the lease on that cable would have been $14,000 per month until the end of the three-year contract. After three years, that rate would most likely increase.

The second trend revealed through SST data is that large, urban schools may have adequate connections, but due to the sheer number of students accessing the Internet simultaneously, the per student access speed is inadequate for administering technology-rich, digital learning (Education Superhighway, 2013). The student enrollment threshold for this is somewhere around 1,000 students. Although some Nevada schools with enrollments higher than 1,000 offer students adequate connectivity, many do not because the price of increasing the speed to accommodate large student enrollments is cost prohibitive.

In short, infrastructure greatly influences whether or not a school can adequately implement a technology-rich program such as *Nevada Ready 21*. Although the solutions are complex, the installation of robust infrastructure across the state is essential to the success of *Nevada Ready 21*, but even more importantly, paramount to the economic development of the state. Nevada's System for Higher Education (NSHE) is but one organization to point this out when they reported "the state's ability to excel in science, technology, engineering, and mathematics is greatly dependent on having good broadband connectivity intra-campus, inter-campus, and to points beyond the state."

ONE-TO-ONE IN OTHER STATES AND LARGE SCHOOL DISTRICTS

MAINE

Currently, the Maine Department of Education is the only state department of education in the nation that administers a statewide one-to-one program (Maine.gov, 2012). Maine's program began in 1999 when the state's governor and legislature, realizing the need for preparing Maine's students for the 21st Century, dedicated a one-time state surplus to equip all middle school teachers and students with personal learning devices. The state took two years to plan the implementation of this initiative and in 2001, the program commenced. Since then, the Maine Learning Technology Initiative (MLTI) has grown and now includes all middle and high schools in the state, with plans to begin issuing devices to elementary students in the near future. MLTI transformed the way education is carried out in Maine's classrooms, and the program is linked to increases in students' writing assessment scores, 21st Century skills development, geographic spatial awareness, and engagement in classroom activities.

RICHLAND SCHOOL DISTRICT, SOUTH CAROLINA

Richland School District Two is one of the fastest growing districts in South Carolina today serving more than 26,000 students. Fifty-nine percent are African-American; 29% white, 3% Asian, 6% Hispanic and 3% classified as other or multi-racial. The district has seen a significant increase in English Language Learners, with fifty-nine different languages spoken throughout the district. Approximately 46% of Richland Two's students qualify for free and reduced lunch.

Equity for all, increased student achievement, student engagement, and the development of 21st century skills were the main drivers for going one-to-one in this 27,000 student district with high levels of poverty. Now finishing their 2nd year of implementation, Richland has already seen positive results. According to district evaluative data, 65% of teachers and students are seamlessly integrating technology into instruction. They have also witnessed significantly higher student engagement, as measured by learner perseverance, aspirations, study habits, and desire to learn.

SUNNYSIDE UNIFIED SCHOOL DISTRICT, ARIZONA

Sunnyside serves a highly economically disadvantaged community, in a state that has been at, or near the bottom of US per-student funding. Approximately 85% of the district's 17,000 students are eligible for free or reduced lunch, with 6% of the student population being homeless. 16% of students receive English Language Learner (ELL) services, and many students come from Spanish speaking homes. In a 2007 study, Johns Hopkins labeled the district a "dropout factory." Therefore, the one-to-one program in Sunnyside began with a focus on increasing graduation rates. District leadership believed that the technology had the potential to motivate students to come to school, and to help meet the individual needs of struggling students.

Aligning instruction and digital curriculum with the research of Project RED, Sunnyside saw immediate statistically verifiable results of the one-to-one computing program. Student attendance, engagement and achievement improved, resulting in the ultimate goal of keeping students in school and on the path to graduation. Between 2007 and 2010, their graduation rates increased from 71% to 82%. Student discipline instances decreased, and overall student behavior improved. Parent engagement soared. By allowing the laptops to go home the district improved communication with parents through online digital channels for collaboration. Open enrollment

numbers also skyrocketed with the promotion of the one-to-one program, providing an important revenue source to continue the staffing levels needed to support the digital transformation. Sunnyside now is on a path to their greater goal of ensuring their students will be successful when they left school, and can effectively engage and contribute to an ever-changing world.

HUNTSVILLE SCHOOL DISTRICT, ALABAMA

Huntsville began their digital conversion to 'networked' learning by implementing a district-wide one-to-one program to 23,000 students three years ago.   District student demographics include: 48% white, 43% black; 6% Hispanic, 3.2% Asian or Pacific Islander and Native American. 46% of the district's students are considered economically disadvantaged.

The district has witnessed great results since the one-to-one program was put in place. Teachers and students are connected and communicating anytime and anywhere. They collaborate; teachers personalize students' learning in highly engaged environments that are available 24/7. Since the one-to-one implementation, student grade level proficiency in math and reading has increased 20%. Graduation rates have increased 14%. Students' increased engagement is demonstrated by a 29% decrease in student in-school suspensions, and 27% decrease in out-of-school suspensions. Huntsville has closed the digital divide for all learners. In tandem with their benchmark assessments, the district saw 5th grade ELA students' increased achievement. Teachers from these schools will collaborate with other teachers, cross district, to ensure all 5th graders reach these standards of success.

ONE-TO-ONE IN NEVADA

One-to-one student computing is not new to Nevada and the majority of school districts are implementing programs in a number of ways. Below are examples of three Nevada schools district programs.

CARSON CITY SCHOOL DISTRICT

In 2012, the Carson City School District in partnership with community stakeholders developed *Empower Carson City*, a 5-year strategic plan with a mission to empower students with the skills, knowledge, values and opportunities to thrive.   One of the goals of the plan is to provide every student with access to one-to-one mobile technology*.* To achieve this goal, Carson CSD provided every middle school student with their own netbook, and equipped all middle school teachers with the ongoing professional development needed to fully utilize this technology ([view video of Carson's program](#)). In 2014, they will begin to move this program into elementary schools as well. Carson CSD received much attention for their program including news coverage from KTVN Channel 2 ([click here to view the story](#)). Teachers created [their own YouTube](#) channel where they post lessons that any teacher in the world may access.

LINCOLN COUNTY SCHOOL DISTRICT

In 2009, Lincoln CSD won a 2-year $245,000 competitive grant through the Nevada Commission on Educational Technology to implement a one-to-one program at one middle school. By leveraging the successes of this project, the district expanded the program to five campuses covering all middle schools in the district. The following year, the district implemented one-to-one computing in all grades 4-12. Substantial student gains were found in four

areas: increased student engagement in classroom activities, increased motivation of low-achieving students, increased use of technology, and increased anytime-anywhere learning. A recent student survey revealed that 79% of students found the integration of netbooks into their classroom activities beneficial to their learning experience.

CLARK COUNTY SCHOOL DISTRICT

In 2012, the Clark County School District launched the e3: Engage, Empower, Explore Project that brought students 24/7 access to iPads. The project goals targeted student achievement, parental involvement, and resource efficiencies, and although all goals were not met during the first year, the schools made positive movement toward reaching them. Several lessons were learned in the first year of this project. First, wifi infrastructure needed to be much more robust than expected, and much of the first year was spent accomplishing that. Wifi enhancements were made before they entered the second year of the program. Additionally, Clark CSD is enhancing their professional development efforts to include more subject-specific teacher training. They found that school administrators are critical to leading change in classroom practices and Clark CSD is ramping up their administrator professional development as well. Principals and teachers alike believe that the program has great potential to effectively transform classroom practices. As one teacher explained, "This year has been a learning experience. Overall, I do not believe that the iPads have significantly enhanced student learning in my class this year. However, I do think that if I continue to work with the iPads next year, I can improve and get more out of them" (Pearson, 2013, p. 1). This is an important point. Technology programs require time for educators and students to internalize and manifest the cultural shift necessary to bring about marked improvements. In time, the e3 Project has great potential to meet their goals and to transform student learning in CCSD.

NEVADA READY 21: A VISION FOR PERSONALIZED LEARNING

Personalizing learning through the appropriate integration of technology will be one of the key drivers of Nevada's success. As was found in the examples of one-to-one above, personalization through the integration of technology increases student engagement, lowers dropout rates, and can lead to the development of important 21st century skills, and ultimately higher student achievement. The example below illustrates a potential vision for personalization.

> Eighth grader Selena awakens early to the sound of her phone alarm and remembers that today is the day for her live video link with students in Japan, Russia and Canada. Her team has been working collaboratively on a cultural exchange project and today they will debate the issues. She sends a group text to her team and their teacher to remind them to review their collaborative paper on their wiki before they meet later today. During Selena's bus journey to school, she connects to the bus' Wi-Fi hotspot from her laptop to listen to the podcast her math teacher updated overnight. While listening, she adds her thoughts to a collaborative notebook on Google Docs. She sees another classmate is also adding notes and uses the chat feature to help him figure out one of the problems. Selena receives an email notification from her English teacher with a download code for the novel they will begin reading next week. She accesses her account and downloads it.
>
> Once at school, Selena checks her calendar and task list on her laptop to see what needs attention first.   She receives her weekly notification from the personal learning planner portal with her

recommended lessons. Selena loves that she can work on the specific skills she missed on her assessments instead of sitting through instruction on concepts she has already mastered.

Selena heads over to the problem solving lab for her next hour.   Each of the ten workstations has different problems to solve. Once she logs in, she starts to work on a problem and notices there are five other students, each from a different country, who are working on the same problem. She joins the chat and asks what she can do to help. The students tell her to review the collaborative lab notebook and see if they missed something and in this way, the students work together to solve the problem. Since her assignments are submitted electronically and digitally time stamped, the teacher knows exactly when they are submitted. Her parents also get a notification when the assignments are graded.

Selena's team uses the group videoconference room for their link-up to the Japanese, Russian, and Canadian students. Hundreds of other students around the world will access the video stream that will be put on the school's website after the event. Later that evening, Selena refers back to the video stream before she submits her assigned reflection paper to her teacher's page on the school's learning management system. While this scenario may seem outlandish or unattainable, it's becoming a prevalent reality for many students across the country. To read further about Selena and her family, click here.

Now is the time to transform education in Nevada to promote student success, to support economic growth, and to build a 21st Century workforce. Nevada's success in the years ahead will require all public and private sector organizations to work together in a focused manner to build out the needed technology infrastructure. It will require making difficult choices, and will require sacrifices of less-important initiatives to focus on the critical challenges facing the State.

KEY ELEMENTS OF *NEVADA READY 21*

Nevada Ready 21 utilizes research findings and addresses Nevada's unique educational landscape to generate bold, focused educational transformation. The team that created this plan was divided into three workgroups. Each workgroup focused on a set of key implementation factors identified by the One-to-One Institute as essential to effective one-to-one project planning: infrastructure, professional development, communication, leadership, evaluation, assessment, and finance (Project Red, 2010). The three workgroups focused on the key elements below.

> **Workgroup 1:** Infrastructure
>
> **Workgroup 2:** Professional Development, Instruction, Assessment
>
> **Workgroup 3:** Leadership, Communication, Finance, Evaluation

SEAT PRICE DEFINED

Each workgroup was tasked with designing the components of their key elements and then to assign a *seat price* to those components. The ultimate goal of the committee was to arrive at a final, comprehensive seat price that included all of the components necessary to implement *Nevada Ready 21* at a school that already had adequate, external infrastructure. Seat prices were based on the typical price districts spend on components.   The seat price can be multiplied by the number of students at a school to arrive at the estimated cost for implementation at that school.

INFRASTRUCTURE

Technology infrastructure is the foundation of *Nevada Ready 21*. Simply put, *Nevada Ready 21* goals cannot be accomplished without adequate internal (local area network or LAN) or external (wide area network or WAN) school infrastructure. Infrastructure is often overlooked during the planning of technology programs possibly because it is invisible and confusing to most people. Nonetheless, infrastructure is arguably the most critical element of *Nevada Ready 21*.

The following table lists the components factored into the seat price for infrastructure, which also includes student and teacher devices. The seat price and, thus, the list do not include infrastructure outside of the building, but it does include everything needed for a school that is already connected through fiber-optic cable.

Internal Infrastructure, Devices, and Software		
Routers	Servers	Switches
Wireless LAN Controllers	Wireless Access Points	Storage
Blade Servers	Data Center Equipment	UPSs
Student Devices with Warranties and Insurance	Laptop Carts for Charging	Protective Backpacks
Teacher Devices with Warranties and Insurance	Batteries	Battery Chargers
Learning Management System	Implementation Services	Productivity Software

INSTRUCTION

The instructional goal of *Nevada Ready 21* is to create a personalized, learner-centered educational experience for all students that focuses on equipping students with 21st Century skills such as communication, collaboration, creativity, and critical thinking. These goals are achieved by concentrating classroom instruction on the Nevada Academic Content Standards and the instructional strategies that foster students' 21st Century skills development.

Statewide, half of Nevada's students are enrolled in a free or reduced lunch program, 15% are English language learners, and 11% are enrolled in a special education program. A statewide goal is to help these learners achieve at higher rates and ensure equity of learning experiences for all. The instructional component of *NV Ready 21* hones in on creating strategies and personalized learning experiences, powered up through technologies, to ensure these students achieve their greatest potential.

Equipping students to stay on the cutting edge in a rapidly changing world requires preparing students to continue their learning beyond K-12 schooling. The Nevada Academic Content Standards (NVACS) emphasize student technology skill development in the context of content.   For instance, K-5 writing standards require students to be able to "…use a variety of digital tools to produce and publish writing, including in collaboration with peers" (Nevada Department of Education, 2010, p. 19). The 6-12 writing standards require students to "…[u]se technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information" (Nevada Department of Education, 2010, p. 43). Similar to the writing standards, NVACS in mathematics and science also develop students' 21st Century

skills, and require students to learn how to learn with technology. Overall, NVACS clearly emphasize the importance of student technology literacy for the purpose of preparing college- and career-ready students.

Nevada Ready 21 includes two Instructional Integration Experts (See description under *Leadership*) who are members of the State Program Team and will facilitate digital classroom instruction that is aligned to the NVACS. The role of the Integration Experts will be to work closely with the Professional Development Experts (See description under *Leadership*) to bring about the instructional changes necessary to create a world-class, 21st Century learning environment for all Nevada students. As the role of teacher changes from disseminator-of-knowledge to facilitator, communicator, and collaborator, so must instruction and learning experiences.

PROFESSIONAL DEVELOPMENT

Next to infrastructure, professional development is the most critical element of *Nevada Ready 21*. Educators are the most essential agents of transformation in the educational system. To become those agents, they must have the support necessary to engage their transformative power. That assistance comes in the form of ongoing, sustained, high-quality professional development. *Nevada Ready 21* provides on-demand, online professional learning opportunities to teachers and administrators in Nevada's urban, rural, and frontier schools. *Nevada Ready 21* professional learning is targeted to educators' specific needs, regardless of their skill levels. As one component of the professional development plan, educators select courses based upon professional values, learn at their own pace, and communicate with other innovative colleagues.

The *Nevada Ready 21* professional development model creates a cadre of coaches who support 25-30 teachers in a face-to-face, online, or blended environment. As such, schools and districts can tailor their opportunities to their specific needs. This model takes into consideration the varying needs of Nevada school districts. Below is a description of the key players' roles in the *Nevada Ready 21* professional development model.

Nevada Ready Professional Development Model

State Leadership Team (see description on *Leadership*)
- Manages statewide learning management system (LMS)
- Develops online modules for teachers
- Populates and disseminates LMS content ; gathers/posts just-in-time resources and examples
- Trains and/or organizes district training for coaches
- Organizes continuing education units (CEUs) that are provided to teachers and administrators
- Provides online instructional course for students, culminating in a " technology driver's license" that certifies the students meet minimum proficiency standards
- Organizes and fosters collaboration among districts
- Develops tools for assessing teacher/administrator PD progress

District Coaches
- Provide professional development and support for 25-30 teachers or administrators that could be face-to-face, online, or both depending on geographic distances, and available, local resources
- Complete a state-run training focused on developing coaching skills
- Work with State Leadership Team to develop a cadre of master educators who will provide support to future cohorts of *Nevada Ready 21* educators
- Work with a new group of educators each year as schools come into the project

Administrators

- Commit to monthly collaborative sessions focused on program vision and leadership
- Commit to mentoring another administrator during second year of implementation.
- Receive CEUs for their participation

Teachers

- All teachers expected to take 15-hour module, either online self-paced, online facilitated, or face-to-face prior to roll-out of student devices
- Percentage of teachers completing the modules may be a factor in choosing schools for roll-out
- Receive devices 3-6 months ahead of students depending on district needs
- During the first year of implementation, each school identifies a cohort of teacher leaders (8 – 10). These teachers are grouped according to content area and receive quarterly PD provided by digital coaches. PD content is framed around 21st Century student experiences.
- Digital coaches follow-up and assist teachers in implementing what was planned during the quarterly workshop. This could be done face-to-face or online. (To view an example of online teacher coaching, click here.)
- Teachers in the first cohort will mentor another teacher at the site during the second year.
- Must show a minimum technology proficiency prior to student roll-out.

COMMUNICATION

Central to *Nevada Ready 21*'s success is a well-planned, pointed communication strategy. Stakeholders must be involved every step of the way throughout the planning, roll-out, and maintenance phases of the program. In addition to soliciting input and feedback from stakeholders, the communication strategy must account for sufficient dissemination of information. *Nevada Ready 21* stakeholders are teachers, administrators, parents and caregivers, students, state and district administrators, community members, business representatives, legislators, and the media.

Most important, communication outreach will specifically target parents and caregivers. Schools will hold meetings with parents to ensure they are informed partners of *Nevada Ready 21*. Furthermore, schools will hold optional classes for parents who wish to increase their computer skills and to learn more about their child's safe and appropriate use of the device.

To best accomplish this goal, a communications professional will be hired as part of the state team (See description on *Leadership*). This individual will report to the Program Manager and Program Director and will work closely with the Public Relations Officer at the Department. The seat price of this position is included in the leadership section below.

LEADERSHIP

Nevada Ready 21 leadership occurs at the school, district, and state levels. Research demonstrates that effective leadership is pivotal for successfully leading school transformation and incorporating technologies.

SCHOOL ADMINISTRATORS School administrators play a key role in fostering school culture. *Nevada Ready 21* school administrators commit to monthly, online professional development that creates a community of leaders who support 21st Century teaching and learning. Second-year *Nevada Ready 21* administrators commit to mentoring incoming first-year administrators, thereby, expanding the community of 21st Century leaders across Nevada.

DISTRICT ADMINISTRATORS *Nevada Ready 21* accounts for the varying needs of districts and encourages districts to individualize their programs to meet their specific district needs. In so doing, each participating district assigns a district administrator to participate in quarterly, online meetings. This person is responsible for ensuring *Nevada Ready 21* meets the individualized goals of the district.

STATE PROGRAM TEAM *Nevada Ready 21* is administered at the state level by a team of professionals whose positions are described below. One position, Program Director, will a state employee of NDE. The remaining eleven positions will be contracted through the vendor and are included in the seat price. NDE will conduct the interviews to fill the eleven positions that will be housed at NDE. All positions other than the Program Director are factored into the seat price.

STATE PROGRAM TEAM

- PROGRAM DIRECTOR (1 Position, NDE Position) - oversees all operations of the program and ensures its success; directs all other *Nevada Ready 21* program staff
- PROGRAM MANAGER (1 Position, Contracted Position) – Oversees the daily operations of the program to ensure that all benchmarks and goals are met
- COMMUNICATIONS OFFICER (1 Position, Contracted Position) – Oversees, produces, and ensures feedback loops through communications with stakeholders; ensures consistent messaging is reaching stakeholders with opportunities for input
- INTERNAL EVALUATOR (1 Position, Contracted Position) – Provides ongoing formative and summative evaluation of the *Nevada Ready 21* program to ensure program goals are met. Incumbent is integrally involved in the initial planning and roll-out phases of the *Nevada Ready 21* program.
- IT ANALYST (2 Positions, Contracted Positions) - Oversees the analysis of and solutions to IT needs in participating schools specific to the demands of *Nevada Ready 21*. This analysis may include but is not limited to school fiber-optic cabling needs, device needs, and internal infrastructure needs.
- PROFESSIONAL DEVELOPMENT EXPERTS (4 Positions, Contracted Positions) –Incumbents work as a collaborative unit in field positions located across Nevada to create and administer professional development that focuses on the Nevada Academic Content Standards and 21st Century skills in alignment with the *Nevada Ready 21* Professional Development Model. Incumbents also utilize existing professional development resources such as those offered by Regional Professional Development Programs and existing online professional development programs such as e-Learning for Educators (e4e).
- INSTRUCTIONAL INTEGRATION EXPERTS (2 Positions, Contracted Positions) – Work closely with the PD experts to design and assemble digital classroom content that is aligned with the Nevada Academic Content Standards and is made available to all Nevada educators online.

EVALUATION AND ASSESSMENT

An internal evaluator is a member of the State Program Team to perform formative and summative evaluations that direct State Program Team activities (see description on *Leadership*). The internal evaluator will evaluate at a minimum the items listed below.

NEVADA READY 21 EVALUATION CRITERIA

- Effects on students (summative)
  - Engagement and motivation
  - Discipline/behavior
  - Attitudes toward learning
  - Academic achievement
  - Graduation Rates
  - Course Completion Rates
- Effects on teachers (summative)
  - Attitudes towards teaching with technology
  - Self-efficacy
  - Shift in pedagogy from teacher-centered to student-centered
- Effects on Parents and Caregivers (summative)
  - Involvement and engagement
- Planning and support: identify educational goals; specify implementation goals (formative)
- High quality, sustained professional development (formative)
- Integration of *Nevada Ready 21* goals into curricular framework (formative)
- Return on investment (summative)

In addition to these broad-based evaluation criteria, all *Nevada Ready 21* teachers and administrators will set written, individualized goals of which the results will be included in annual, summative evaluation reports. School districts will be responsible for ensuring these data are collected and reported to the state evaluator.

FINANCE

Technology need not be an additional expense for schools. Other industries look to technology as a cost-saving solution. *Nevada Ready 21* creates opportunities for cost savings, and for students and teachers to innovate in new learning environments, powered by technology. Schools spend much on supplemental print materials (textbooks, paper assessments, handouts, etc.) and those expenses would be avoided in a digital, paperless, *Nevada Ready 21* learning environment. A recent study revealed (Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012):

- The electricity to power one student laptop costs about $11 a year as opposed to $80 per year for a desktop. Netbooks cost even less because they require less power. iPads and Android-based tablets use significantly less power than a netbook. If students charge their laptops at home, the savings are higher;
- Travel expenses are saved through online professional learning;
- Teacher attendance increased at schools with well-implemented one-to-one programs, which translated to a cost-savings associated with hiring substitute teachers;
- A decrease in disciplinary problems that translated into a cost-savings for schools;
- Efficiency and productivity lead to cost avoidance through use of technology tools, applications, software for administrative, data retrieval and archive, communication, and production of resources.

COST SUMMARY

As noted throughout this section, the cost of *Nevada Ready 21* can be measured in terms of a "seat price" that includes all of the key elements described in the previous pages. Below is a summary of that seat price. In addition to the seat price, additional expenses are

SEAT PRICE SUMMARY

Key Elements Included in Seat Price	Seat Price
Internal Infrastructure	
Devices	
Software	$610
Professional Development	
State Program Team	

ADDITIONAL YEAR 1 AND YEAR 2 EXPENSES

Elements	Year 1	Year 2	Total Cost
Program Director Salary	$120,000	$120,000	$240,000
Consultant Fees for Assistance with Contract Negotiations	$10,000	$0	$10,000
Consultant Fees for Year 1 and Year 2 Program Mentoring	$50,000	$50,000	$100,000
Program Operating Expenses (Travel, Meetings, Supplies, Program Director's Office Setup)	$15,000	$10,000	$20,000
Incentives for WAN Upgrades (see *Infrastructure Improvements* on the next page)	$5,000,000	$5,000,000	$10,000,000
Total	**$5,195,000**	**$5,180,000**	**$10,370,000**

When making a large investment, such as is the case for *Nevada Ready 21*, measures should be taken to ensure that the conditions within the participating districts will provide for their potential success. Participating schools, therefore, will be required to meet rigorous requirements. The following sections outline these requirements and the *Nevada Ready 21*'s selection criteria.

INFRASTRUCTURE IMPROVEMENTS

As was stated in the *Infrastructure Challenges* section of the *Rationale* of this document, one of the most important outcomes that grew out of the *Nevada Ready 21* planning process is the recognition that many Nevada schools lack the external infrastructure to carry out an effective one-to-one program. External infrastructure refers to the way in which a building connects to the internet and is referred to as the wide area network (WAN). Ideally, every school in Nevada would be connected through fiber-optic cable. The *Nevada Ready 21* seat price includes internal Infrastructure necessities, but it does not include WAN costs. Incentive matching grants will be made available to a few schools that are within close reach of fiber-optic access and otherwise meet the selection requirements.

A district's Internet connection greatly influences whether or not their schools can effectively implement a technology-rich program such as *Nevada Ready 21*. The solution for this problem is complex, and requires high-level organization and planning. The Commission recommends the following measures be taken.

1. State executive leadership enlists state agencies such as Transportation, Enterprise Services, Health and Human Services, Education, and System of Higher Education along with Nevada counties to map out ways schools and other entities may tap into existing and future fiber-optic infrastructure.
2. The Nevada Department of Education under the leadership of the *Nevada Ready 21* program director works with telecom providers on statewide, scaled pricing to connect all schools in Nevada.
3. The Nevada Department of Education under the leadership of the *Nevada Ready 21* Program Director in conjunction with the Nevada Broadband Taskforce works toward improved school connectivity.
4. The Nevada Department of Education under the leadership of the *Nevada Ready 21* Program Director forms a committee comprised of school district, state, private sector, and non-profit representatives that focuses on improving school connectivity. This committee works with the groups described in 1-3.

NEVADA READY 21 SELECTION REQUIREMENTS

To apply to participate in *Nevada Ready 21*, schools must meet specific selection criteria. These criteria are established to ensure successful implementation.

1. School WAN connections must meet or exceed 100 kbps per student in accordance with SETDA's recommendation for digital learning readiness (Fox, Waters, Fletcher & Levin, 2012).
2. The school principal must commit to participation in *Nevada Ready 21* professional development activities and to create a school culture that promotes students' personalized access to a connected, 21st Century education.
3. *Nevada Ready 21* will target entire schools and partial school participation will not be allowed. All the teachers in the school must commit to full participation, which includes participating in all professional

development activities and a willingness to promote students' personalized access to a connected, 21st Century education.

4. Schools with high populations of students enrolled in programs of English language learning, special education, and free and reduced lunch will be given preference.

5. First, second, and third-round applications are open only to middle school. Fourth, fifth, and sixth-round applications are open only to high school.

NEVADA READY 21 APPLICATION SELECTION PROCESS

To participate in *Nevada Ready 21*, school districts must submit plans that will be reviewed and approved by the Nevada Commission on Educational Technology. As part of their plans, school districts will map out the steps they intend to take to bring individualized, learner-centered, standards-focused education to the forefront of their students' educational experiences. District plans will clearly define the instructional goals, the steps they will employ to achieve these goals, and the measures they will use to gauge progress. The plans will also include a description of resources they will utilize to implement their plans. The following selection process will be employed.

1. Districts will apply on behalf of schools within their jurisdiction.

2. Districts may apply on behalf of schools that meet the selection requirements above.

3. As part of their applications, districts will submit plans that lay out the steps they will take to successfully implement their programs. The plans will address the seven key elements (infrastructure, instruction, professional development, communication, evaluation and assessment, leadership, and finance) and how the elements will be addressed in the district's program. Plans will also address how state and district resources will be utilized to support the success of the project. Furthermore, plans must include measurable objectives and the steps they will take to attain these objectives.

4. The request for applications will be created and approved by the Nevada Commission on Educational Technology.

5. Late applications will not be considered.

6. A seven-member review committee will be appointed by the Commission to review applications and make a funding recommendation to the Commission. The *Nevada Ready 21* Program Director, with the approval of the Commission, will select the members of this committee. This committee will be comprised of representatives from NDE, the Commission, private sector, Program Mentors, non-applicant schools and school districts, and any other entity the Program Director and Commission see fit.

7. The Commission must approve the recommendations of the review committee for the funds to be approved for distribution.

Nevada Ready 21 is intended to be an ongoing program with proven successes for many years to come. The timeline below offers a framework for roll-out, implementation, and maintenance. The timeline takes into account that the funding becomes available in July of the first year of the biennium. Each year coincides with a fiscal year (July 1-June 30).

	Timing	Description
Year 1	July 1	Funds are released and the program begins
	July	Begin search for Program Director
	August	Program Director selected
	September	RFA is released to find a vendor that will provide the NR21 package (LAN infrastructure, student and teacher devices, teacher and administrator professional development, 11 State Program Team members, and possibly instructional content)
	October	NDE begins search to fill state program team positions
	November	State program team begins working toward roll-out of NR21
	November	Program Director begins working toward statewide broadband improvements
	February	Commission-approved RFA to select the first-round middle schools is released to school districts
	April	First-round schools are selected for the program by the review committee and approved by the Commission
	April	Devices and infrastructure are ordered for first-round schools
	June	Teachers receive their devices. Infrastructure and student devices are delivered to districts.
	June	First-round teacher and administrators begin NR21 professional development programs
	June	Year 1 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 1 Ends

Year 2	July 1	Year 2 Begins
	Summer	Devices are delivered to districts and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the second-round middle schools is released to school districts
	February	Second-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for second-round schools
	March	First-round administrators are selected to become mentors for the second round administrators
	June	Second-round teacher and administrators begin NR21 professional development programs
	June	Year 2 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 2 Ends

Year 3	July 1	Year 3 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the third-round middle schools is released to school districts
	February	Third-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for third-round schools
	March	First-round and second-round administrators are selected to become mentors for the third-round administrators
	June	Third-round teacher and administrators begin NR21 professional development programs
	June	Year 3 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 3 Ends

Year 4	July 1	Year 4 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the fourth-round high schools is released to school districts
	February	Fourth-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for fourth-round schools
	March	First-, second-, and third-round administrators are selected to become mentors for the fourth-round administrators
	June	Fourth-round teacher and administrators begin NR21 professional development programs
	June	Year 4 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 4 Ends

Year 5	July 1	Year 5 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the fifth-round high schools is released to school districts
	February	Fifth-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for fifth-round schools
	March	First-, second-, third-, and fourth round administrators are selected to become mentors for the fifth-round administrators
	June	Fifth-round teacher and administrators begin NR21 professional development programs
	June	Year 5 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 5 Ends

Year 6	July 1	Year 6 Begins
	Summer	Devices are distributed and infrastructure installed
	September	*Nevada Ready 21* first-round schools start program
	January	Commission-approved RFA to select the sixth-round high schools is released to school districts
	February	Sixth-round schools are selected for the program by the review committee and approved by the Commission
	February	Devices and infrastructure are ordered for sixth-round schools
	March	First-, second-, third-, fourth-, and fifth round administrators are selected to become mentors for the sixth-round administrators
	June	Sixth-round teacher and administrators begin NR21 professional development programs
	June	Year 6 summative evaluation report is submitted to the Commission by the Program Director
	June 30	Year 6 Ends

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APPENDIX 3: PARTNERS AND SPONSORS

Connect Nevada, in partnership with the Nevada Broadband Task Force, supports Nevada's reinvention and technological transformation through innovation, job creation, and entrepreneurship via the expansion of broadband technology and increased usage by Nevada residents. In 2009, Connect Nevada partnered with the Nevada Broadband Task Force to engage in a comprehensive broadband planning and technology initiative as part of the national effort to map and expand broadband. The program began by gathering provider data to form a statewide broadband map, and has progressed to the planning and development stage. At this point the program is expanding to: include community engagement in local technology planning; identify opportunities with existing programs; and implement technology projects designed to address digital literacy, improve education, give residents access to global Internet resources, and stimulate economic development. www.connectnv.org

Connect Nevada is a subsidiary of Connected Nation and operates as a non-profit in the state of Nevada. The public-private initiative has been established to work with each of the state's broadband providers to create detailed maps of broadband coverage, to conduct surveys to assess the current state of broadband adoption across Nevada, and to help communities plan for technology expansion. Connect Nevada's efforts are funded by the United States Department of Commerce's State Broadband Initiative (SBI) grant program through the National Telecommunications and Information Administration. More information is available at http://www.broadband.gov.

Connected Nation (Connect Nevada's parent organization) is a leading technology organization committed to bringing affordable high-speed Internet and broadband-enabled resources to all Americans. Connected Nation effectively raises the awareness of the value of broadband and related technologies by developing coalitions of influencers and enablers for improving technology access, adoption, and use. Connected Nation works with consumers, community leaders, states, technology providers, and foundations, including the Bill & Melinda Gates Foundation, to develop and implement technology expansion programs with core competencies centered on a mission to improve digital inclusion for people and places previously underserved or overlooked. www.connectednation.org

National Telecommunications and Information Administration (NTIA) is an agency of the United States Department of Commerce that is serving as the lead agency in running the State Broadband Initiative (SBI). Launched in 2009, NTIA's State Broadband Initiative implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which envisioned a comprehensive program, led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Economic development, energy efficiency, and advances in education and healthcare rely not only on broadband infrastructure, but also on the knowledge and tools to leverage that infrastructure.

NTIA has awarded a total of $293 million for the SBI program to 56 grantees, one each from the 50 states, 5 territories, and the District of Columbia, or their designees. Grantees such as Connect Nevada are using this funding to support the efficient and creative use of broadband technology to better compete in the digital economy. These state-created efforts vary depending on local needs but include programs to assist small businesses and community institutions in using technology more effectively, developing research to investigate barriers to broadband adoption, searching out and creating innovative applications that increase access to government services and information, and developing state and local task forces to expand broadband access and adoption.

Since accurate data is critical for broadband planning, another purpose of the SBI program is to assist states in gathering data twice a year on the availability, speed, and location of broadband services, as well as the broadband services used by community institutions such as schools, libraries, and hospitals. This data is used by NTIA to update the National Broadband Map, the first public, searchable nationwide map of broadband availability, launched February 17, 2011.

Additional Partners/Collaborative Projects:

- Stronger Economies Together, hosted by the State USDA
- WNDD and creation of the Comprehensive Economic Development Plan
- Nevada Health Information Exchange, board member
- IBM Smarter Cities Grant Project
- City of Reno Innovation Council
- Governor's Telemedicine Working Group
- Department of Education, Technology Committee, 1:1 project plan
- BTOP and BIP all grantee infrastructure committee meeting
- FCC Rural Broadband Experiments collaborative meeting
- Boys and Girls Club of Truckee Meadows, Digital Learning Project
- Tahoe Regional Planning Agency, grant planning
- Governor's Business and Industry: Technology and IT Infrastructure Committee

APPENDIX 4: THE NATIONAL BROADBAND PLAN

The National Broadband Plan, released in 2010 by the Federal Communications Commission, has the express mission of creating a high-performance America—a more productive, creative, efficient America in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications. The plan seeks to ensure that the entire broadband ecosystem—networks, devices, content and applications— is healthy.

The plan recommends that the country adopt and track the following six goals to serve as a compass over the next decade:

GOAL No. 1:
At least 100 million U.S. homes should have affordable access to actual download speeds of at least 100 megabits per second and actual upload speeds of at least 50 megabits per second.

GOAL No. 2:
The United States should lead the world in mobile innovation, with the fastest and most extensive wireless networks of any nation.

GOAL No. 3:
Every American should have affordable access to robust broadband service and the means and skills to subscribe if they so choose.

GOAL No. 4:
Every American community should have affordable access to at least 1 gigabit per second broadband service to anchor institutions such as schools, hospitals, and government buildings.

GOAL No. 5:
To ensure the safety of the American people, every first responder should have access to a nationwide, wireless, interoperable broadband public safety network.

GOAL No. 6:
To ensure that America leads in the clean energy economy, every American should be able to use broadband to track and manage their real-time energy consumption.

To learn more, visit: www.broadband.gov
.

APPENDIX 5: WHAT IS CONNECTED?

The goal of Connect Nevada's "Connected" program is to empower locally informed and collaborative technology planning that addresses each community's need for improved access, adoption, and use of technology:

ACCESS – Does your community have access to affordable and reliable broadband service?

ADOPTION – Is your community addressing the barriers to broadband adoption?

USE – Are residents using technology to improve their quality of life?

Connected Nation leverages state-based, public-private partnerships to engage residents at the local level. Regionally based staff provide "train-the-trainer" activities to local leaders, such as librarians, school administrators, economic development professionals, and public officials and help them organize multi-sector technology planning teams, inventory local technology resources, and develop initiatives; assess local technology access, adoption, and use; and develop local strategies that target specific technology gaps in the community.

Connected's community technology-planning framework is cyclical. As with other forms of community planning – and especially so with technology planning – change is the only constant. At the community level, changing technology requirements, shifting demographics, economic drivers, and workforce requirements may expose or create new digital divides. Connected's community technology-planning framework supports a sustained effort.

Connected Planning Process

Connected's community technology-planning framework provides a clear path for the sustainable acceleration of broadband access, adoption, and use

CONNECTED PLANNING PROCESS

1	ENGAGE
2	ASSESS
3	PLAN
4	ACT

Step 1: Engage.

Successful strategies to bridge the local digital divide and increase broadband access, adoption, and use are predicated on broad and sustained stakeholder participation. A successful local technology planning team should include people from multiple sectors, including:

- State and Local Government
- Public Safety
- Education (K-12, Higher Ed)
- Library
- Business & Industry, Agriculture, Recreation and Tourism
- Healthcare
- Community Organizations
- Technology Providers

Step 2: Assess.

The Connected planning process guides the local technology planning team through an assessment of community technology resources, strengths, assets, needs, and gaps in order to identify and develop strategies to address specific technology gaps and opportunities in the community. Bolstered by benchmarking data that had been gathered through Connect Nevada's mapping and market research, the local technology planning team works with community members to benchmark local broadband access, adoption, and use via the Connected Assessment, which measures:

ACCESS	ADOPTION	USE
1. Broadband Availability	6. Digital Literacy	10. Economic Opportunity
2. Broadband Speeds	7. Public Computer Centers	11. Education
3. Broadband Competition	8. Broadband Awareness	12. Government
4. Middle Mile Access	9. Vulnerable Population Focus	13. Healthcare
5. Mobile Broadband Availability		

Step 3: Plan.

Once community resources and needs are identified, the community planning team begins to identify local priorities and policies, programs, and technical solutions that will accelerate broadband access, adoption, and use. Connected Nation provides recommended actions based on best practices from communities across the United States.

Step 4: Act.

The technology planning team works together to ensure that selected policies, programs, and technical solutions are adopted, implemented, improved, and maintained. The Connected program also provides a platform for collaboration and the sharing of best practices between communities. Connected Nation also provides communications support to raise awareness of a community's efforts. For communities that measurably demonstrate proficiency in broadband access, adoption, and use in the Connected Assessment, Connected Nation offers Connected certification, a nationally recognized certification that provides an avenue for pursuing opportunities as a recognized, technologically advanced community.

APPENDIX 6: GLOSSARY OF TERMS

#

3G Wireless - Third Generation - Refers to the third generation of wireless cellular technology. It has been succeeded by 4G wireless. Typical speeds reach about 3 Mbps.

4G Wireless - Fourth Generation - Refers to the fourth generation of wireless cellular technology. It is the successor to 2G and 3G. Typical implantations include LTE, WiMax, and others. Maximum speeds may reach 100 Mbps, with typical speeds over 10 Mbps.

A

ARRA - American Recovery and Reinvestment Act.

ADSL - Asymmetric Digital Subscriber Line - DSL service with a larger portion of the capacity devoted to downstream communications, less to upstream. Typically thought of as a residential service.

ATM - Asynchronous Transfer Mode - A data service offering by ASI that can be used for interconnection of customers' LAN. ATM provides service from 1 Mbps to 145 Mbps utilizing Cell Relay Packets.

B

Bandwidth - The amount of data transmitted in a given amount of time; usually measured in bits per second, kilobits per second, and megabits per second.

BIP - Broadband Infrastructure Program - Part of the American Recovery and Reinvestment Act (ARRA), BIP is the program created by the U.S. Department of Agriculture focused on expanding last mile broadband access.

Bit - A single unit of data, either a one or a zero. In the world of broadband, bits are used to refer to the amount of transmitted data. A kilobit (Kb) is approximately 1,000 bits. A megabit (Mb) is approximately 1,000,000 bits.

BPL - Broadband Over Powerline - An evolving theoretical technology that provides broadband service over existing electrical power lines.

BPON - Broadband Passive Optical Network - A point-to-multipoint fiber-lean architecture network system which uses passive splitters to deliver signals to multiple users. Instead of running a separate strand of fiber from the CO to every customer, BPON uses a single strand of fiber to serve up to 32 subscribers.
Broadband - A descriptive term for evolving digital technologies that provide consumers with integrated access to voice, high-speed data service, video-demand services, and interactive delivery services (e.g. DSL, cable Internet).

BTOP - Broadband Technology Opportunities Program - Part of the American Recovery and Reinvestment Act (ARRA), BTOP is the program created by the U.S. Department of Commerce focused on expanding broadband access, expanding access to public computer centers, and improving broadband adoption.

C

Cable Modem - A modem that allows a user to connect a computer to the local cable system to transmit data rather than video. It allows broadband services at speeds of five Mbps or higher.

CAP - Competitive Access Provider - (or "Bypass Carrier") A company that provides network links between the customer and the Inter-Exchange Carrier or even directly to the Internet Service Provider. CAPs operate private networks independent of Local Exchange Carriers.

Cellular - A mobile communications system that uses a combination of radio transmission and conventional telephone switching to permit telephone communications to and from mobile users within a specified area.

CLEC - Competitive Local Exchange Carrier - Wireline service provider that is authorized under state and federal rules to compete with ILECs to provide local telephone and Internet service. CLECs provide telephone services in one of three ways or a combination thereof: a) by building or rebuilding telecommunications facilities of their own, b) by leasing capacity from another local telephone company (typically an ILEC) and reselling it, or c) by leasing discreet parts of the ILEC network referred to as UNEs.

CMTS - Cable Modem Termination System - A component (usually located at the local office or head end of a cable system) that exchanges digital signals with cable modems on a cable network, allowing for broadband use of the cable system.

CO - Central Office - A circuit switch where the phone and DSL lines in a geographical area come together, usually housed in a small building.

Coaxial Cable - A type of cable that can carry large amounts of bandwidth over long distances. Cable TV and cable modem broadband service both utilize this technology.

Community Anchor Institutions (CAI) - Institutions that are based in a community and larger user of broadband. Examples include schools, libraries, healthcare facilities, and government institutions.

CWDM - Coarse Wavelength Division Multiplexing - Multiplexing (more commonly referred to as WDM) with less than 8 active wavelengths per fiber.

D

Dial-Up - A technology that provides customers with access to the Internet over an existing telephone line. Dial-up is much slower than broadband.

DLEC - Data Local Exchange Carrier - DLECs deliver high-speed access to the Internet, not voice. DLECs include Covad, Northpoint, and Rhythms.

Downstream - Data flowing from the Internet to a computer (surfing the net, getting e-mail, downloading a file).

DSL - Digital Subscriber Line - The use of a copper telephone line to deliver "always on" broadband Internet service.

DSLAM - Digital Subscriber Line Access Multiplier - A piece of technology installed at a telephone company's CO that connects the carrier to the subscriber loop (and ultimately the customer's PC).

DWDM - Dense Wavelength Division Multiplexing - A SONET term which is the means of increasing the capacity of SONET fiber-optic transmission systems.

E

E-rate - A federal program that provides subsidy for voice and data lines to qualified schools, hospitals, Community-Based Organization (CBOs), and other qualified institutions. The subsidy is based on a percentage designated by the FCC.

Ethernet - A local area network (LAN) standard developed for the exchange data with a single network. It allows for speeds from 10 Mbps to 10 Gbps.

EON - Ethernet Optical Network - The use of Ethernet LAN packets running over a fiber network.

EvDO - Evolution Data Only - A new wireless technology that provides data connections that are 10 times faster than a regular modem.

F

FCC - Federal Communications Commission - A federal regulatory agency that is responsible for, among other things, regulating VoIP.

Fixed Wireless Broadband - The operation of wireless devices or systems for broadband use at fixed locations such as homes or offices.

Franchise Agreement - An agreement between a cable provider and a government entity that grants the provider the right to serve cable and broadband services to a particular area - typically a city, county, or state.

FTTH - Fiber To The Home - Another name for fiber To The Premises, where fiber optic cable is pulled directly to an individual's residence or building allowing for extremely high broadband speeds.

FTTN - Fiber To The Neighborhood - A hybrid network architecture involving optical fiber from the carrier network, terminating in a neighborhood cabinet that converts the signal from optical to electrical.

FTTP - Fiber To The Premise (Or FTTB - Fiber To The Building) - A fiber optic system that connects directly from the carrier network to the user premises.

G

Gbps - Gigabits per second - 1,000,000,000 bits per second or 1,000 Mbps. A measure of how fast data can be transmitted.

GPON - Gigabyte-Capable Passive Optical Network - Uses a different, faster approach (up to 2.5 Gbps in current products) than BPON.

GPS - Global Positioning System - A system using satellite technology that allows an equipped user to know exactly where he is anywhere on earth.

GSM - Global System for Mobile Communications - This is the current radio/telephone standard in Europe and many other countries except Japan and the United States.

H

HFC - Hybrid Fiber Coaxial Network - An outside plant distribution cabling concept employing both fiber optic and coaxial cable.

Hotspot - See Wireless Hotspot.

I

IEEE - Institute of Electrical and Electronics Engineers (pronounced "Eye-triple-E.").

ILEC - Incumbent Local Exchange Carrier - The traditional wireline telephone service providers within defined geographic areas. They typically provide broadband Internet service via DSL technology in their area. Prior to 1996, ILECs operated as monopolies having the exclusive right and responsibility for providing local and local toll telephone service within LATAs.

IP-VPN - Internet Protocol - Virtual Private Network - A software-defined network offering the appearance, functionality, and usefulness of a dedicated private network.

ISDN - Integrated Services Digital Network - An alternative method to simultaneously carry voice, data, and other traffic, using the switched telephone network.

ISP - Internet Service Provider - A company providing Internet access to consumers and businesses, acting as a bridge between customer (end-user) and infrastructure owners for dial-up, cable modem, and DSL services.

K

Kbps - Kilobits per second - 1,000 bits per second. A measure of how fast data can be transmitted.

L

LAN - Local Area Network - A geographically localized network consisting of both hardware and software. The network can link workstations within a building or multiple computers with a single wireless Internet connection.

LATA - Local Access and Transport Areas - A geographic area within a divested Regional Bell Operating Company is permitted to offer exchange telecommunications and exchange access service. Calls between LATAs are often thought of as long-distance service. Calls within a LATA (IntraLATA) typically include local and local toll telephone services.

Local Loop - A generic term for the connection between the customer's premises (home, office, etc.) and the provider's serving central office. Historically, this has been a wire connection; however, wireless options are increasingly available for local loop capacity.

Low Income - Low income is defined by using the poverty level as defined by the U.S. Census Bureau. A community's low-income percentage can be found at www.census.gov.

M

MAN - Metropolitan Area Network - A high-speed date intra-city network that links multiple locations with a campus, city, or LATA. A MAN typically extends as far as 50 kilometers (or 31 miles).

Mbps - Megabits per second - 1,000,000 bits per second. A measure of how fast data can be transmitted.

Metro Ethernet - An Ethernet technology-based network in a metropolitan area that is used for connectivity to the Internet.

Multiplexing - Sending multiple signals (or streams) of information on a carrier (wireless frequency, twisted pair copper lines, fiber optic cables, coaxial, etc.) at the same time. Mutiplexing, in technical terms, means transmitting in the form of a single, complex signal and then recovering the separate (individual) signals at the receiving end.

N

NTIA - National Telecommunications and Information Administration, which is housed within the United States Department of Commerce.

NIST - National Institute of Standards and Technology.

O

Overbuilders - Building excess capacity. In this context, it involves investment in additional infrastructure projects to provide competition.

OVS - Open Video Systems - A new option for those looking to offer cable television service outside the current framework of traditional regulation. It would allow more flexibility in providing service by reducing the build-out requirements of new carriers.

P

PON - Passive Optical Network - A Passive Optical Network consists of an optical line terminator located at the Central Office and a set of associated optical network terminals located at the customer's premises. Between them lies the optical distribution network comprised of fibers and passive splitters or couplers.

R

Right-of-Way - A legal right of passage over land owned by another. Carriers and service providers must obtain right-of-way to dig trenches or plant poles for cable and telephone systems and to place wireless antennae.

RPR - Resilient Packet Ring - Uses Ethernet switching and a dual counter-rotating ring topology to provide SONET-like network resiliency and optimized bandwidth usage, while delivering multi-point Ethernet/IP services.

RUS - Rural Utility Service - A division of the United States Department of Agriculture that promotes universal service in unserved and underserved areas of the country through grants, loans, and financing.

S

Satellite - Satellite brings broadband Internet connections to areas that would not otherwise have access, even the most rural of areas. Historically, higher costs and lower reliability have prevented the widespread implementation of satellite service, but providers have begun to overcome these obstacles, and satellite broadband deployment is increasing. A satellite works by receiving radio signals sent from the Earth (at an uplink location also called an Earth Station) and resending the radio signals back down to the Earth (the downlink). In a simple system, a signal is reflected, or "bounced," off the satellite. A communications satellite also typically converts the radio transmissions from one frequency to another so that the signal getting sent down is not confused with the signal being sent up. The area that can be served by a satellite is determined by the "footprint" of the antennas on the satellite. The "footprint" of a satellite is the area of the Earth that is covered by a satellite's signal. Some satellites are able to shape their footprints so that only certain areas are served. One way to do this is by the use of small beams called "spot beams." Spot beams allow satellites to target service to a specific area, or to provide different service to different areas.

SBI - State Broadband Initiatives, formerly known as the State Broadband Data & Development (SBDD) Program.

SONET - Synchronous Optical Network - A family of fiber-optic transmission rates.
Streaming - A Netscape innovation that downloads low-bit text data first, then the higher bit graphics. This allows users to read the text of an Internet document first, rather than waiting for the entire file to load.

Subscribership - Subscribership is the number of customers that have subscribed for a particular telecommunications service.

Switched Network - A domestic telecommunications network usually accessed by telephones, key telephone systems, private branch exchange trunks, and data arrangements.

T

T-1 - Trunk Level 1 - A digital transmission link with a total signaling speed of 1.544 Mbps. It is a standard for digital transmission in North America.

T-3 - Trunk Level 3 - 28 T1 lines or 44.736 Mbps.

U

UNE - Unbundled Network Elements - Leased portions of a carrier's (typically an ILEC's) network used by another carrier to provide service to customers.

Universal Service - The idea of providing every home in the United States with basic telephone service.

Upstream - Data flowing from your computer to the Internet (sending e-mail, uploading a file).

V

VDSL (or VHDSL) - Very High Data Rate Digital Subscriber Line - A developing technology that employs an asymmetric form of ADSL with projected speeds of up to 155 Mbps.
Video On Demand - A service that allows users to remotely choose a movie from a digital library and be able to pause, fast-forward, or even rewind their selection.

VLAN - Virtual Local Area Network - A network of computers that behave as if they were connected to the same wire even though they may be physically located on different segments of a LAN.

VoIP - Voice over Internet Protocol - A new technology that employs a data network (such as a broadband connection) to transmit voice conversations.

VPN - Virtual Private Network - A network that is constructed by using public wires to connect nodes. For example, there are a number of systems that enable one to create networks using the Internet as the medium for transporting data. These systems use encryption and other security mechanisms to ensure that only authorized users can access the network and that the data cannot be intercepted.

Vulnerable Groups -Vulnerable groups will vary by community, but typically include low-income, minority, senior, children, etc.

W

WAN - Wide Area Network - A communications system that utilizes cable systems, telephone lines, wireless, and other means to connect multiple locations together for the exchange of data, voice, and video.

Wi-Fi - Wireless Fidelity - A term for certain types of wireless local networks (WLANs) that uses specifications in the IEEE 802.11 family.

WiMax - A wireless technology that provides high-throughput broadband connections over long distances. WiMax can be used for a number of applications, including last mile broadband connections, hotspots, and cellular backhaul and high-speed enterprise connectivity for businesses.

Wireless Hotspot - A public location where Wi-Fi Internet access is available for free or for a small fee. These could include airports, restaurants, hotels, coffee shops, parks, and more.

Wireless Internet - 1) Internet applications and access using mobile devices such as cell phones and palm devices. 2) Broadband Internet service provided via wireless connection, such as satellite or tower transmitters.

Wireline - Service based on infrastructure on or near the ground, such as copper telephone wires or coaxial cable underground, or on telephone poles.

WISP – Wireless Internet Service Provider.

APPENDIX 7: LETTERS OF SUPPORT

NNRDA
NORTHEASTERN NEVADA REGIONAL DEVELOPMENT AUTHORITY

Northeastern Nevada Regional Development Authority
1500 College Pkwy, McMullen Hall #120 * Elko, NV 89801
*775-738-2100 www.eceda.com

July 11, 2014

Lindsey Harmon
State Program Coordinator
Connect Nevada

Dear Ms. Harmon:

I am writing to you today in support of Connect Nevada. The Northeastern Nevada Regional Development Authority (NNRDA) was a partner in the recent broadband inventory that resulted in the City of Elko being designated a "Connected Community." The distinction is one we can market to attract new businesses and to help established businesses expand. We are grateful to Connect Nevada for its assistance in the project. We could not have been successful without it.

In addition to your work with NNRDA, you have helped partner organizations including the City of Elko, Elko County, the Elko County School District and Great Basin College as well as private sector organizations to identify their strengths and weaknesses in regard to technological capacities. I know it has put those organizations in a position to receive additional resources from alternative funding sources to help serve their constituents more effectively. We are pleased we could be a part of that process as well.

We encourage the Nevada legislative and executive offices, along with Nevada's Federal Delegation to assure continued funding of Connect Nevada. Your work is a critical component of the continued economic advancement of the State of Nevada.

Sincerely,

Pam Borda

Pam Borda

Executive Director

california **broadband** cooperative

<div align="right">July 8, 2014</div>

To Whom It May Concern:

I am writing this letter in support of continued funding for Connect Nevada, a non-profit organization in partnership with the Nevada Broadband Taskforce.   To date this organization has made important advances in bringing broadband to Nevada.   Unfortunately federal funding runs out at the end of this year, leaving an uncertain future.

As a not-for-profit broadband communications cooperative established to bring next-generation communications services to northern Nevada and Eastern California, CBC is acutely aware of the considerable challenges Nevada faces in promoting, funding and deploying high-speed internet to rural areas throughout Nevada. Connect Nevada has been instrumental in consolidating critical information on the needs of these areas and collaborating with medical, educational and government entities to define requirements and possible solutions. It has provided focus on the needs of communities and the emerging concern of digital illiteracy.

Like elsewhere, Nevada is increasingly challenged to remain competitive in the global economy.   Critical sectors of the state economy have already been disrupted over the past several decades, as regulatory and demographic shifts occur. This situation will accelerate over the next decade as major discontinuities in information technology emerge from disruptive innovations like Cloud Computing, Big Data, Cognitive Computing, and the Internet-of-Everything (IoE).   As these innovations coalesce, new relations between people and people, people and things, and among things on their own will change the way we work, communicate, recreate, and exercise our responsibilities as citizens.   And, in the end, all of this depends on broadband connectivity that Nevada presently finds limited, and in some places absent.

Connect Nevada will enable the State of Nevada to understand these trends, bring attention to the challenges, and help policy makers, entrepreneurs, and community leaders create initiatives that grow this critically-needed twenty-first century infrastructure.

We encourage on going funding and support for Connect Nevada.

Sincerely yours,

By: Michael T. Ort
Its: Chief Operating Officer

July 11, 2014

Ms. Lindsey Harmon
State Program Manager
Connect Nevada
100 N. Stewart St.
Nevada State Library & Archives Building
Carson City, NV 89701

Dear Ms. Harmon:

I am writing to you today in support of Connect Nevada. Great Basin College was a partner in the recent broadband inventory that resulted in the City of Elko being designated a "Connected Community." The distinction is one the community can market to attract new businesses and to help established businesses expand. It also provides greater opportunity for us to serve our students. We are grateful to Connect Nevada for its assistance in the project. We could not have been successful without it.

In addition to your work with Great Basin College, you have helped partner organizations including the City of Elko, Elko County, the Elko County School District and the Northeast Nevada Regional Development Authority, as well as private sector organizations to identify their strengths and weaknesses in regards to technological capacities. I know it has put those organizations in a position to receive additional resources from alternative funding sources to help serve their constituents more effectively. We are pleased we could be a part of that process as well.

We encourage the Nevada legislative and executive offices, along with Nevada's Federal Delegation to assure continued funding of Connect Nevada. Your work is a critical component of the continued economic advancement of the State of Nevada.

Sincerely,

Dr. Mark A. Curtis
President

ELKO MAIN CAMPUS
1500 College Parkway
Elko, NV 89801
775.738.8493 • fax 775.738.8771

ELY CENTER
2115 Bobcat Drive
Ely, NV 89301
775.289.3589 • fax 775.289.3599

PAHRUMP VALLEY CENTER
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Pahrump, NV 89048
775.727.2000 • fax 775.727.2014

WINNEMUCCA CENTER
5490 Kluncy Canyon Road
Winnemucca, NV 89445
775.623.4824 • fax 775.623.1812

www.gbcnv.edu

July 14, 2014

Ms. Lindsey Harmon
State Program Manager
Connect Nevada
100 N. Stewart Street
Carson City, NV 89701

Dear Ms. Harmon:

The Nevada Hospital Association (NHA) is pleased to provide this letter of support for Connect Nevada to secure continued funding to expand broadband access, adoption and use through Nevada.

NHA is a not-for-profit, statewide trade association representing the majority of Nevada hospitals, including acute care, psychiatric, rehabilitation and specialty hospitals.
As the grant recipient of the Nevada Broadband Telemedicine Initiative, NHA recently announced that aerial construction has begun on the Nevada Broadband Telemedicine Initiative (NBTI). Construction will begin in Goldfield, with crews working north towards Reno and south towards Las Vegas.

Once completed, the NBTI will be Nevada's only all-fiber, public use network of its kind to link Reno and Las Vegas. The network as designed will be entirely within the borders of the state and will provide the lowest latency route between the two cities. The NBTI will provide the capability for state-of-the-art, telemedicine applications and advanced, broadband access to residents in rural Nevada.

In this role, we rely on Connect Nevada to serve as the centralized resource for broadband initiatives in the state to best coordinate our efforts and focus awareness on the importance of statewide broadband connectivity. Without this continued federal funding, rural communities would be without the benefits of Connect Nevada's broadband mapping, research, and planning.

NHA strongly encourages the continued funding of Connect Nevada and support their efforts to address connectivity issues for community anchor institutions while working to support economic development within Nevada's future technology- and investment-friendly communities.

Sincerely,

Bill M. Welch
President & CEO

City of Elko
City Hall
1751 College Avenue
Elko, Nevada 89801
Phone: 775-777-7110
Fax: 775-777-7119

Wednesday, July 16, 2014

Dear Ms. Harmon:

I am writing to you today in support of Connect Nevada. The City of Elko was a partner in the recent broadband inventory that resulted in the City of Elko begin designated a "Connected Community." The distinction is one we can market to attract new businesses and to help established businesses expand. We are grateful to Connect Nevada for its assistance in the project. We could not have been successful without it.

In addition to your work with the City of Elko, you have helped partner organizations including the Elko County, the Elko County School District and Great Basin College as well as private sector organizations to identify their strengths and weaknesses in regards to technological capacities. I know it has put those organizations in a position to receive additional resources from alternative funding sources to help serve their constituents more effectively. We are pleased we could be a part of that process as well.

We encourage the Nevada legislative and executive offices, along with Nevada's Federal Delegation to assure continued funding of Connect Nevada. Your work is a critical component of the continued economic advancement of the State of Nevada.

Sincerely,

Chris J. Johnson, City of Elko Mayor

September 9, 2014

Dear Governor Sandoval:

I write to you on behalf of the members of the Nevada Commission on Educational Technology in support of Connect Nevada. Over the past five years, Connect Nevada has provided local assistance to school districts by providing much needed broadband resource to several rural Nevada schools. Additionally, Connect Nevada has assisted the Nevada Department of Education on several endeavors including the annual broadband summit that highlights the specific, substantial bandwidth needs of schools. In the fall, Connect Nevada will begin a statewide broadband planning process that will prove invaluable to the state as we look to improve broadband efficiency across government and industry.

Furthermore, as schools and school districts begin to move toward one-to-one student computing, it is imperative for all Nevada students to have access to adequate school connectivity. Connect Nevada has taken a special interest in ensuring Nevada is ready for a statewide one-to-one program such as the one the Commission has planned.

I understand that Connect Nevada is in jeopardy of losing their funding at the end of this year. I hope there is a way to continue funding Connect Nevada in the coming years. As the need for improved broadband capacity increases across the state, so does the necessity for organizations like Connect Nevada that target and troubleshoot our state's dire broadband needs. Connect Nevada is valuable to NDE, the Commission, and to the citizenry of Nevada.

Sincerely,

David White, Chair
Nevada Commission on Educational Technology